

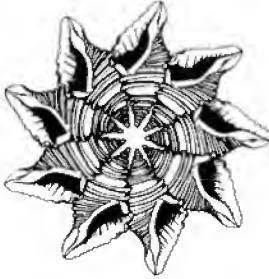
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CONCHOLOGIST

Quarterly Journal of the Conchologists of America, Inc.

CONCHOLOGISTS OF AMERICA, INC.



In 1972, a group of shell collectors saw the need for a national organization devoted to the interests of shell collectors; to the beauty of shells, to their scientific aspects, and to the collecting and preservation of mollusks. This was the start of COA. Our membership includes novices, advanced collectors, scientists, and shell dealers from around the world. In 1995, COA adopted a conservation resolution: Whereas there are an estimated 100,000 species of living mollusks, many of great economic, ecological, and cultural importance to humans and whereas habitat destruction and commercial fisheries have had serious effects on mollusk populations worldwide, and whereas modern conchology continues the tradition of amateur naturalists exploring and documenting the natural world, be it resolved that the Conchologists of America endorses responsible scientific collecting as a means of monitoring the status of mollusk species and populations and promoting informed decision making in regulatory processes intended to safeguard mollusks and their habitats.

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Editor's notes: This is a rather grim issue in terms of our losses to conchology. The "In Memoriam" box on page 17 contains 8 names. While some were not unexpected, others were surprising and none is without an accompanying sense of grief. Peter Clarkson was a last minute addition to this list and he will be remembered in the next issue. All of these people added to our organization or to conchology as a whole, in one way or another. Each will be sorely missed.

-- COA CONVENTION--

Due to a slight mix up in mailing, the last issue had only some of the inserts for the COA Convention, 12-17 July, 2011, at Port Canaveral, Florida. The included inserts were enough to get members registered, but we missed the specialized inserts for shell shows and such. They are included in this issue. PLEASE BE ADVISED: all of the convention material is available online at the COA website: www.conchologistsofamerica.org. Just click on "conventions" and then on the links to "Conventions, Guidelines and Registration" or "Bourse Agreement," depending upon which you need. Specific questions about the convention can be addressed to Doris Underwood at: dunderwood13@cfl.com. If any of this is a problem or doesn't work, contact me at thomas@nerite.com or 505-896-0904 and I will try to chase down your question to find an answer. Our venue for this year's convention is the Radisson Resort (see the pictures on page 32 and below). We were there in 2001 and I am certainly happy for a chance at a repeat. While we won't have a shuttle launch this time, we will be staying at a beautiful spot with lots to do both at the hotel and in the local area.



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Front cover: *Euprotomus bulla* (Röding, 1798) feeding on algae at 60 feet depth on rocks during the day off Sulawesi, Indonesia. Photographed by Charles Rawlings. This species will still be listed under *Strombus* in most shell reference books, but was reassigned to *Euprotomus*. For a detailed look at genera assignments within Strombidae see the article by Winston Barney in the September 2010 issue (Vol. 38, No. 3).

Back cover: This Olividae montage was created by Niumul Bahar. He is originally from Bangladesh near the Bay of Bengal (thus his early interest in shells). He now lives in Trent in the U. K., where he is a histopathologist and a consultant. We will show more of his work in future issues.

A Moveable feast

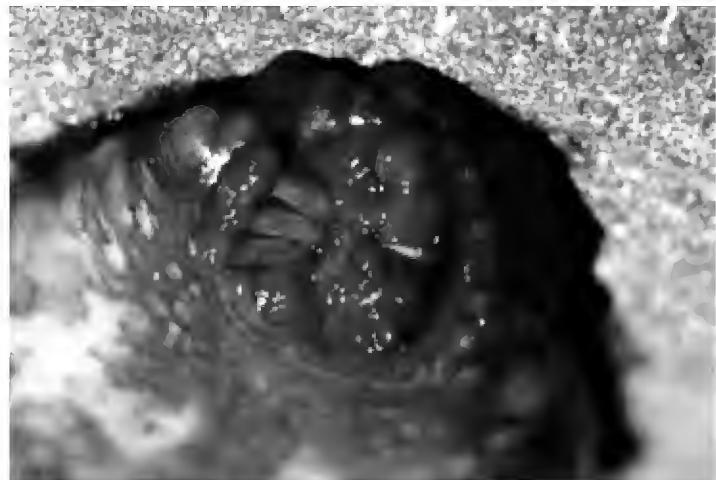
by George Metz (photographs by the author)

There are many ways that mollusks gather their daily meal(s). There are also some generally colorful terms that all of you are probably acquainted with to describe these various activities. Animals that eat plants or their products are called herbivores. Molluscan examples would be Strombidae, Neritidae, Acmaeidae, and Littorinidae: all herbivorous grazers. Those that eat other animals are called carnivores. Molluscan examples would include Conidae and Muricidae. A third group eats both plant and animal and are called omnivores. Man is a good example of an omnivore, but it is a bit more difficult to find a mollusk that fits this description. Aquarists and conchologists who have kept Cypraeidae have reported some species, in a family thought of as herbivorous grazers, will actually feed upon fish and molluscan carcasses. Finally we have saprovores, animals that feed primarily on dead animal tissue, like the Nassariidae.

Another aspect of feeding is the variety of techniques used in obtaining food. Most bivalves and a few gastropods such as the Calyptaeidae are filter feeders. They induce a flow of water through the shell by ciliary action. This water is then filtered, straining out the microscopic material, which the mollusks use as food. Carnivores, such as Conidae and Turridae, track other animals, sometimes following chemical trails, and then use a modified tooth that delivers a toxin to kill their prey. Other gastropod carnivores such as Muricidae and Naticidae bore holes in the protective shells of other mollusks and feed directly on the body of the prey mollusk. Among the Cephalopoda, squid and octopuses are active hunters. Some animals feed on detritus which contains some edible organic material. The Turritellidae use strands of mucus-covered threads to sort through the detritus then draw the mucous threads back into the mouth. The majority of gastropods seem to be either herbivores or carnivores.

Another method of molluscan feeding, not often mentioned, is found with species using parasitism. While it is true that parasites might be considered carnivores, there are actually key differences. Parasites differ from carnivores in that the food they consumes is not the flesh of the prey animal. Instead the food is in the form of fluid, such as blood, lymph, or whatever the prey uses as a circulatory fluid. Another distinction is that carnivores usually kill their prey. Successful parasites feed on their prey, but do not generally kill, as that would eliminate their "dinner" permanently. Rather they continuously feed on their prey, enough to keep themselves alive, but not enough to kill the prey.

Surprisingly, there are a large number of gastropod families that feed in this manner; Pyramidellidae prey on bivalves and other invertebrates (Robertson, 2006), while Epitoniidae, Architectonicidae, and Coralliophilidae prey on Anthozoa. There are five other smaller families that feed on various organisms in a parasitic manner. The Cancellariidae, specifically *Cancellaria cooperi* Gabb, 1865, parasitizes the Pacific electric ray (*Torpedo californica* Ayres, 1855) as reported by O'Sullivan et al. (1987). Buck (1991) reports observing the same species parasitizing the big red sea urchin *Strongylocentrotus franciscanus* (A. Agassiz, 1863) and the sea star *Tethyaster canaliculatus* (A. H. Clark, 1916). Johnson et al. (1995) reported parasitism on sleeping parrotfish by



1. Unidentified eulimids (two very small white shells in the center of the image) on the holothurian *Isostichopus fuscus* Ludwig. Photographed in shallow water in the Sea of Cortez Baja, Mexico.

several species of Colubrariidae and at least two species of the family Marginellidae.

There are also several descriptive terms or characters used in discussing the lifestyle of parasites. First they may be obligate parasites, meaning that they cannot live independently of their host. They cannot electively leave their feeding site or death might occur. With mollusks this generally means they do not have a retractable proboscis and will be fatally injured if removed. The proboscis is a long flexible muscular tube that allows the animal to bore into the prey and suck out fluids. The opposite of this state are the nonobligate parasites like eulimids with a retractable proboscis. This allows the parasite to remove itself from the host without damage and move to another host (Fig 1).

A second character is the position of the parasite on the host. Ectoparasites exist on the outer surface of the host. Endoparasites live within the lumen of the intestinal tract or within the intestinal wall itself. Some molluscan genera that live within the wall of the intestine have through time reduced or lost their shells. Many genera feed on the external surface of the prey animal, eating the surface epithelial cells (an exception to the fluid eating characteristic). Others penetrate the surface with their proboscis and successfully enjoy the circulatory fluid of the host and later may voluntarily retract their proboscis and drop off the prey. This sounds a little like a "vampire" movie without the transformation into a bat.

One of the most efficient families among molluscan parasites is the Eulimidae. The family is quite large with hundreds of genera and numerous species that closely resemble each other or show only very subtle differences, making correct identification difficult. The shells are generally small and conical, 4-15mm in length, and shiny white, although both globose and limpet-like forms occur. These mollusks have an exclusive association with a single phylum of prey animals, the Echinodermata, involving



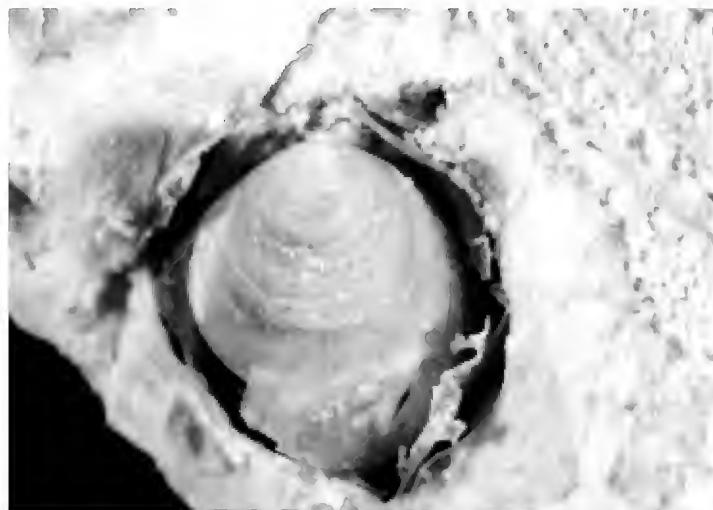
2. (above) Gall on *Eucidaris thoursii* (Valenciennes), in the Sea of Cortez, Baja, Mexico.



4. (above) *Stilifer* gall on an Indo-Pacific sea star.

3. (below) Opened gall showing *Sabinella shaskyi* Warén, 1992, in the Sea of Cortez, Baja, Mexico.

5. (below) *Stilifer* species in a gall that has been opened.



members of the classes that include sea stars, brittle stars, sea urchins, and sea cucumbers. Each species of eulimid is parasitic exclusively on the members of one class or genus and often limit its feeding activities to only one or two species. A very thorough and lucid explanation of the Eulimidae, including their biology, morphology, and reproductive strategies, as well as a full discussion of all the currently recognized genera, is found in a monograph of the family by Anders Warén (1983).

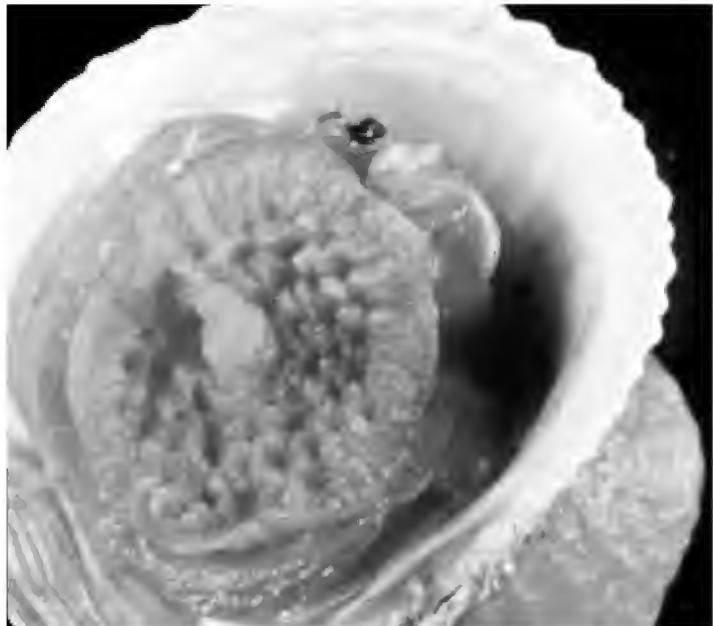
There are some spectacular and unique prey/host relationships among this group. One of the mysteries to me is how a eulimid can drop off of a moving holothurian. Why give up a known meal source for an unknown source? Does the eulimid just wait till another holothurian wanders by? Where does it wait? How does it know when the next one is coming? The eulimid groups that attracted my interest are those groups that take up permanent residence on the echinoderms of their choice, in other words obligate parasites.

In the waters of the eastern Pacific, specifically the Sea of Cortez, the eulimid species *Sabinella shaskyi* Warén, 1992 parasitizes the sea urchin *Eucidaris thouarsii* (Valenciennes,

1846), also known as the slate pencil sea urchin. The spines of this sea urchin are quite thick and the outer epidermis has a sandpaper-like texture. These sea urchins are common in rocky areas and are usually wedged among the rocks. If enough specimens are examined one will eventually find an urchin with a swelling on the tip of one of the spines. This swelling is commonly referred as a "gall" (Fig. 2). The roof of the gall is very thin. If the end or tip of the gall is opened carefully a small cavity can be exposed. When examined with a little magnification the eulimids within this cavity can be seen. There are usually two or more shells in each gall. The large shell is usually a female and the smaller shells male. There may also be some egg cases (Fig. 3). The eulimid is entombed in the gall cavity and is very successful there. In the Caribbean, there is a similar species of sea urchin and a eulimid of the same genus (*Sabinella*) as the Sea of Cortez eulimid that develops in a very similar-appearing gall. Both the sea urchins and the eulimids from the two separate areas are obviously closely related and most likely developed into separate species after the land bridge formed by the isthmus of Panama joined the two Americas (during the Pliocene, about 3-5 million years ago) and separated the oceans.



6. *Thyca (Besomia) callista* Berry, 1957, on the sea star *Phataria unifascialis* in the Sea of Cortez.



7. Underside of female *Thyca callista* with the edge of the male shell at the two o'clock position on the body of the female, Gulf of California.

Some genera such as *Stilifer* also create “galls” in various species of sea stars (Fig. 4). They accomplish this by boring through the exoskeleton of the sea star and penetrating the coelom (a cavity filled with nutritious fluids) with their proboscis. The female and the male become encased in a pseudopallium. The pseudopallium is a portion of the mantle that lines the cavity for protection and storage of eggs. The epithelial surface of the sea star grows back over the cavity, forming a “gall” (Fig. 5). If you are in a tourist area, particularly on either one of the North American coasts, where shell shops usually abound, you will nearly always find a basket or bin of dried starfish. Examine them carefully for galls. If you find one with a gall, first, pay for it. Then, at your leisure open it carefully and you might find a member of the genus *Stilifer*.

The last eulimid I want to discuss also parasitizes sea stars but in a more complex fashion. There are several species in the genus *Thyca*, all of which act in the same manner. *Thyca* are limpet-shaped shells and appear as if they should belong to Acmaeidae or other limpet-like families. *Thyca crystallina* (Gould, 1846), occurs throughout the Pacific. It is limited to preying on members of the sea star genus *Linkia*. It preys on the species; *Linckia miliaris*, *L. multiforis*, and *L. laevigata*. The shell and its prey are beautifully illustrated on the back cover of the *American Conchologist* vol. 32(3) (2004). A second species *Thyca (Besomia) callista* Berry, 1959 is found in the eastern Pacific and the Sea of Cortez. It preys on sea stars of the genus *Phataria*, specifically the species *P. unifascialis* and *P. pyramidata*.

Thyca have an interesting biology. The fertilized eggs float in the water column until they find the sea star of their choice, where they settle on the dorsal surface. While migrating to the ventral surface of the host they continue to develop in size until they find the perumbilacral groove. Once in position, they drill through the surface epithelium and the exoskeleton into the coelom, where they feed for the life of the sea star (Fig. 6). They become so fixed to the sea star that the proboscis fuses in the scar tissue of the host. Because of this they are fixed in place for life: obligate parasites. The advantages are that they have food for life and they have solved the reproductive problem, by allowing the male to become fixed to the female’s body beneath her shell, where he feeds on the female’s body fluids (Fig. 7).

This is a fascinating family to observe and I hope this short account will stimulate *American Conchologist* readers to examine every echinoderm found when collecting in warm waters or purchased in a tourist shop. It might have a hitchhiker!

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Another sinistral *Notocypraea* and some interesting observations

Don Cram

I read with interest the excellent article on sinistral cowries by Harry Lee in the September 2010 issue of *American Conchologist*. Of particular interest was his reference to the *Notocypraea declivis* (G.B. Sowerby III, 1870) briefly mentioned in Griffiths's 1962 review. The specific reference was this entry between his descriptions of *Notocypraea declivis* and *Notocypraea dissecta* (Iredale, 1831): "Remarks: The only sinistral specimen of Cypraeidae known to the author is in the South Australian Museum" (SAM). In April 1975 I wrote to the museum (SAM) inquiring about this shell, but a reply from the Curator of Marine Invertebrates, Dr. Zeidler, via his assistant Caroline Ristic, stated that no reference in their records to this or any other specimen of a sinistral *Cypraea* could be found.

Lt. Col. R.J. Griffiths (ex British Army) and a collector with a special interest in *Cypraea* since the early 1950s arrived in Victoria in 1958 and during the next two years most of his *Notocypraea* research was done by collecting widely, describing one new species, making many radular mounts, visiting all major museums, identifying specimens, and completing his review. I had access to much of his material extant in the Australian Museum Sydney, Western Australian Museum, the National Museum Melbourne (now Museum Victoria (MV)), and the SAM, where in 1959 he examined Sir Joesph Verco's original specimens of *Notocypraea euclia* (Steadman & Cotton, 1946), trawled in 1912 off Eucla, Western Australia, making one radular mount (Cram 2009 & 2010). Some time in 1960 he started a nature park (Sea Acres Sanctuary) at Port Macquarie, NSW, which he sold about a decade later, also selling his shell collection, and he then disappeared from the scene. His work was meticulous, initialing and dating most of it, and I am sure the sinistral *Cypraea* (he did not specifically state *declivis*) did exist but has since been lost.

On 24 February 1995, Mrs Alena Bubenicek of Victoria, a member of the Malacological Society of Australia (MSA), collected some *Notocypraea* specimens from the Lighthouse Reef at Port MacDonnell, but did not realize until several days later while cleaning the shells that she had a sinistral specimen of *Notocypraea comptonii* (Gray, 1847). This specimen (here illustrated for the first time) shown at a branch meeting and reported in the Victorian Branch Bulletin (VBB) No. 180, August



A composite image of the first known sinistral *Notocypraea comptonii*, collected by Mrs. Alena Bubenicek from the Lighthouse Reef at Port MacDonnell, South Australia in 1995. Also shown is the original data slip. The shell measures 22.8mm in length, 15.1mm in width, and 12.1mm in height. From photographs by Dr. Platon Vafiadis.

1995, appears to be the first sinistral specimen ever collected of *Notocypraea comptonii*.

On 8 January 1974, while collecting with family at this same Lighthouse Reef, we were watching six *Notocypraea* specimens we had collected, three normal *N. comptonii* and three pure white (*casta* form) crawling around in the collecting bucket. At this time and to our astonishment, two normal and two pure white specimens decided to mate. The male specimens with their penises visible, situated just to the rear of the right hand tentacle, approached the females by crawling up from behind to approximately one third of the way along the left hand side of the females and they immediately became locked together.

After watching this for a brief time I made a dash for a camera, some 50 meters away in the car. By the time I got it set up the activity was just finishing, but the photo revealed the mating position and the penis of the male is still visible. In hindsite it would have been better to have stayed and watched. As the female genital aperture is toward the right rear behind the mantle cavity, it appears as though the penis, which in the preserved state is approximately one third the length of the shell, reaches across the

body of the female and inserts only the tip into the genital aperture. This raises an interesting question: are these organs and all others reversed in the body of a sinistral specimen? Alena wishes now that she had realized prior to cleaning that her specimen was sinistral, as she would have tried to keep the animal intact. Is it also significant that the specimens chose partners of the same variety?

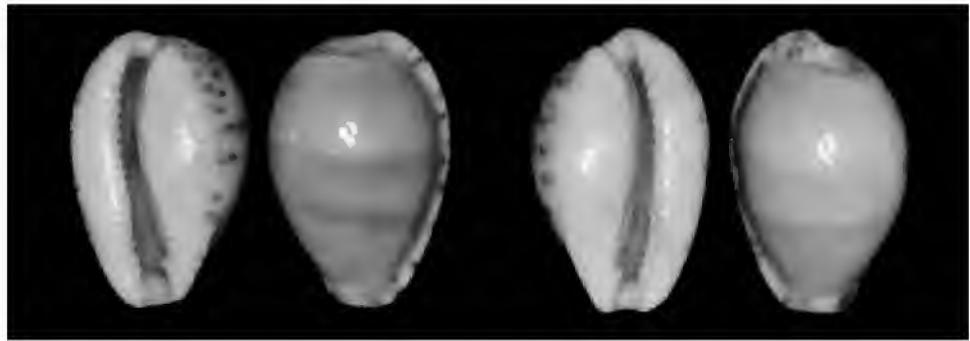
On 5 February 1978, while photographing some *Notocypraea* collected at Flinders Ocean Reef, I was surprised that one specimen of *Notocypraea angustata* (Gmelin, 1791) discharged a magenta dye from the right rear of the animal while crawling in a dish of sea water. This fortunately occurred while looking through the lens at the specimen and I now have a record of this on a 35mm slide. I have not seen this in any other specimen of southern or tropical cowry I have collected before or since. I have shown the slide at various shell club meetings and reported it in VBB No. 151 October 1990, without any further evidence of this happening with any species of cowry. It appears this may be a defense mechanism to discourage predators.

Autotomy has been observed (Griffiths, 1962a) in juvenile specimens of *N. angustata*, when he and Mr Altorfer of Port MacDonnell made a collecting trip together in 1960. Oliviform specimens were observed discarding part of their foot when retracting into their shells on being picked up. There is obviously still a lot to be discovered about this fascinating group of cowries.

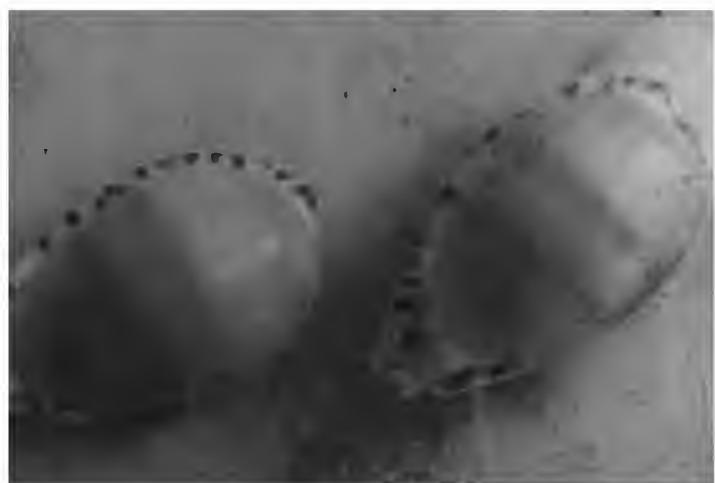
I would like to thank Alena Bubenicek for the loan of the specimen to study, Robert Burn and Platon Vafiadis for interesting discussions on cowry anatomy, and Platon for photographing the shell. Finally thanks to Mrs Hope Black (née Macpherson), Curator Emeritus of Museum Victoria and co-author with Charles Gabriel of *Marine Molluscs of Victoria*, for information on R.J.Griffiths whom she personally knew. She was curator at MV when he was conducting his *Notocypraea* research.

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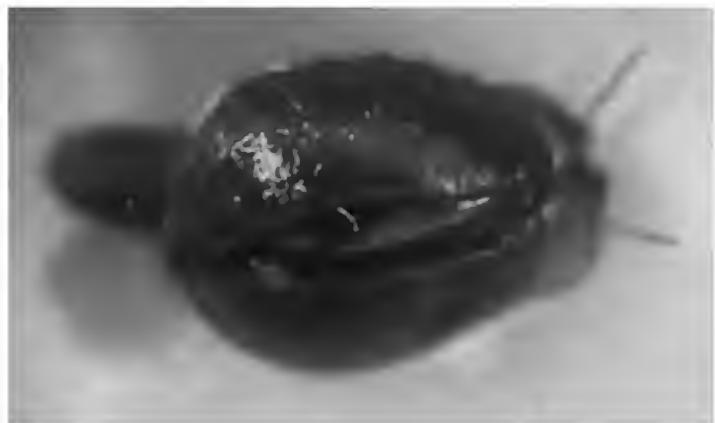


A side-by-side comparison of Mrs. Bubenicek's sinistral *N. comptonii* (left) and a similarly sized specimen (right) in the author's collection that was collected from the same reef at Port MacDonnell. Photographs by Dr. Platon Vafiadis.



(Above) A pair of *Notocypraea comptonii* just after mating. The male is on the right; the female (retracted into her shell) is on the left.

(Below) *Notocypraea angustata* releasing what appears to be a dye, a previously unrecorded activity.



The curious case of Conchology versus Malacology

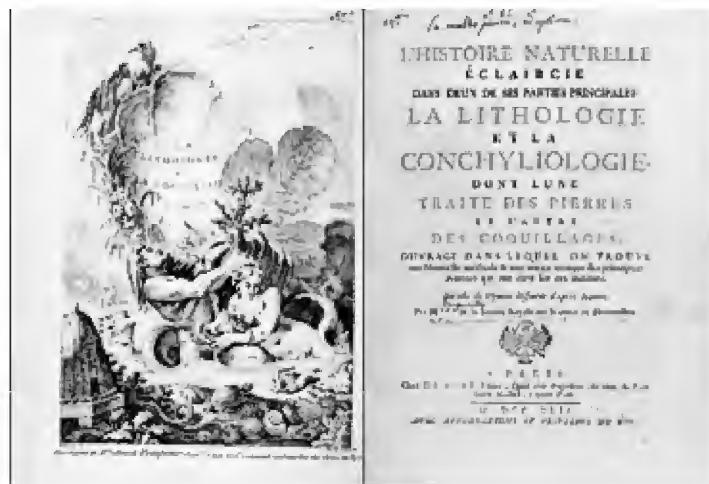
S. Peter Dance

Two words, one idea

What is *conchology*? That is a question I usually find difficult to answer. On one occasion in the early 1960s I found it unanswerable. At the time I was on the staff of the Natural History Museum in London, where I was responsible for curating its huge shell collection. It would have been reasonable to assume someone occupying that position would know something about shells and their inmates. Someone connected with the making of radio programs made that assumption and it led to my first radio interview. The interviewer opened up with, "Now, Mr Dance, can you tell us, what is *conchology*?" I was dumbstruck and wished the ground would swallow me up. Lamely, I said, "Please don't ask me that. Can we start again?" Fortunately, we could, because the programme was pre-recorded. This was not my finest hour. If I am honest, I had suffered an attack of stage fright. Encapsulating in a few words the essence of my main interest in life at that time was not only difficult but impossible.

Less often I am asked, "What is *malacology*?" My usual answer is not very helpful, something like, "It's the same as *conchology*, really, the study of mollusks in the widest sense." I may explain further that *conchology* is the earlier term, but is mistakenly considered by some to be restricted to the study of molluscan shells. A year or two after my stuttering attempt to conquer the airwaves, I began the research for my first book, *Shell Collecting, an Illustrated History* (Dance, 1966). At an early stage I realised I could not use both of these terms indiscriminately, but would have to choose one or the other. Having investigated the origins and usages of each, I devoted a section of the book (Appendix III, pp 270-274) to an elucidation of the problem they posed. Some of its main points I shall repeat here.

In 1742, in a pioneering book about shells and fossils, a Frenchman, A. J. Dezallier d'Argenville (1680 - 1765), coined the term *conchyliologie*, derived from two Greek words, *konkylion* (little shell, but it may also mean the animal within) and *logos* (discourse) (Dezallier d'Argenville, 1742). I produced evidence to suggest that he intended *conchyliologie* to mean the study of mollusks as a whole and not merely their shells. Almost thirty years later the equivalent English term, *conchology*, made its first appearance in print, in a book attributed to E. M. da Costa, an industrious and unconventional character, of mixed parentage but born in England (da Costa, 1771). Written while he was serving a prison sentence for embezzlement, the book was never completed and never had a title page, but it is generally known under the title of *Conchology, or Natural History of Shells*. The word *conchology* appears only once in its few pages and is not defined therein, but as it is obviously a translation of *conchyliologie* it may be considered to have the same meaning. A few years later another Frenchman, Christophe Elizabeth Favart d'Herbigny (1725 - 1793) defined *conchyliologie* as "...the science which deals in general with testaceous animals or those covered with a test known as a shell, or the knowledge of shell-fish of the sea, the land and fresh water" (Favart d'Herbigny, 1775). Da Costa, who was familiar with French scientific literature, may soon have come across Favart d'Herbigny's book and seen the definition of



(Above) The faceplate (left) and title page (right) of d'Argenville's *L'Histoire Naturelle* where he introduced the term *conchyliologie* in 1742.

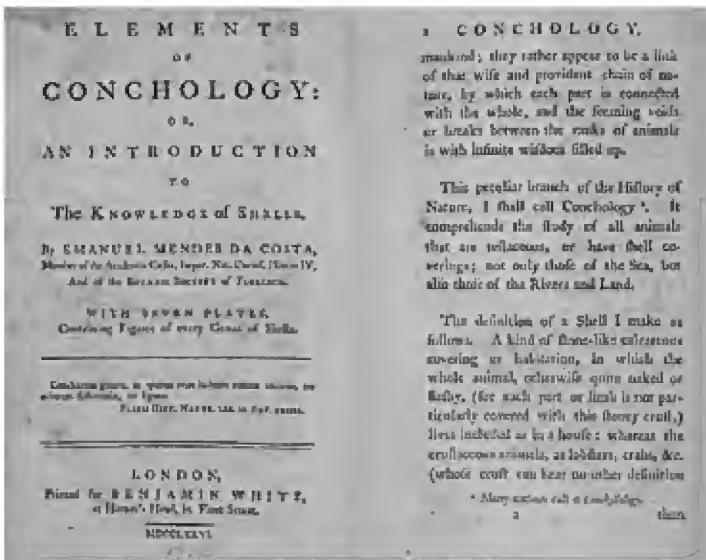
(Below) A.J. Dezallier d'Argenville is perhaps better known for his writings on formal gardening (landscaping) than his work on mollusks. He was a member of the Royal Society. It was this organization from which Costa embezzled money and was subsequently sent to prison where he wrote his unpublished *Conchology, or Natural History of Shells* in 1771.



conchyliologie therein. It is not surprising, therefore, that he seems to have adapted it for use in his own *Elements of Conchology*, published in the following year, thereby providing a definition of *conchology*, the word he had not defined when introducing it to the English language five years earlier (da Costa, 1776).

Après Rafinesque le déluge!

It was not until 1814 that the term *malacologie* was introduced, without a definition, in a treatise on the nomenclature and classification of animals and plants (Rafinesque, 1814). Born



Da Costa's *Elements of Conchology* published in 1776: title page (left) and page 2 (right) where he defines conchology, probably based upon the earlier work of the Frenchman Favart d'Herbigny.

in Turkey, but of French extraction, C. S. S. Rafinesque (1783 - 1840) was clever but wildly eccentric. His *Somiologiques* (1814), a rare oddity like himself, is not easily understood. His text makes it clear, however, that *malacologie* was his term for the study of mollusks, as he understood them, i.e. mollusks in their entirety, not just their shells. A few years later the term appeared again, in a treatise published in 1825 by the French zoologist H. M. de Blainville (1777-1850), who considered *conchyliologie* signified the study of molluscan shells, rather than molluscan animals. He wanted to adopt *malacologie*, an abbreviation of *malacozoologie*, derived from the Greek words *malakos* (soft), *zōion* (animal) and *logos* (discourse). He defined *malacologie* as "...a rational discourse or treatise on soft-bodied animals," but the definition, it seems, applies not only to the soft bodies of mollusks, but to the soft bodies of other invertebrates, as well. Moreover, his book is entitled *Manuel de Malacologie et de Conchyliologie*, implying, as do its contents, that *malacologie* was not an all-embracing term. For de Blainville the study of molluscan soft parts was *malacologie*, the study of molluscan shells being *conchyliologie*. Ever since, there has been disagreement about the usage of the terms *conchology* and *malacology* (or their equivalents in other languages).

Agreeing to differ

In Appendix III of my book I said that the pendulum seemed to have swung in favour of *malacology*, possibly because the ‘scientific’ fraternity was keen to promote a term supposedly accentuating the importance of the soft parts. I was quick to point out that *conchology*, much the older term, had been favoured by, among others, G. P. Deshayes (1797-1875), an eminent authority on the Mollusca. In his *Traité élémentaire de Conchyliologie* he said that because the soft parts produce the shell it was impossible to make two sciences out of two inseparable things (Deshayes, 1839-58). This and a conviction that the older term should precede the younger in a book chronicling the history of shell collecting,



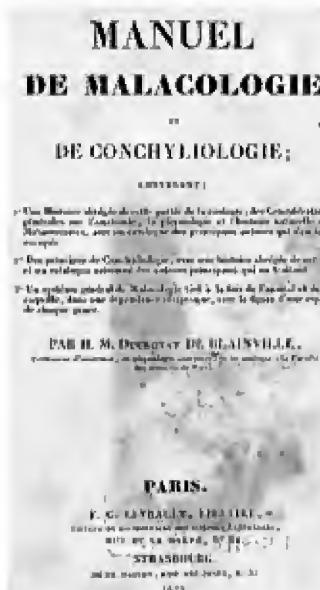
(Above) The *Somiologiques* by Rafinesque, published in 1814, with the title page (left) and page 9 (right) where he lists malacologie as the study of mollusks.

(Below) Constantine Samuel Rafinesque was a botanist, zoologist, malacologist (his term), meteorologist, linguist, and anthropologist. His writings on early Native American culture have been both lauded (he helped decipher ancient Mayan and recorded numerous early American earthworks, many later destroyed by development) and labeled as a hoax (his writings on the Lenape of Eastern North America were later determined to be false).



sufficed for me to prefer *conchology*.

I chose *conchology* partly because of its etymology and partly because it had been in use for many years before *malacology* came on the scene. Another way of looking at the problem, however, was proposed by Robertson (1990). It was not etymology or priority that should decide the issue, he said, but usage – and emotions! The two opposing views were deep-seated, he said, and he instanced the names of four leading organizations devoted to the study of mollusks: the American Malacological Union and the Conchologists of America in the USA, the



(Above) De Blainville's *Manuel de Malacologie* (1825), title page (left) and page 2 (right) where he defines his terms (separating conchology and malacology) and references Rafinesque's use of malacology.

(Below) Henri Marie Ducrotay de Blainville was both a zoologist and an anatomist. He was a member of the French Academy of Sciences and in 1830 was appointed to succeed Jean-Baptiste Lamarck as Chair of Natural History at the Paris Museum.



Malacological Society of London and the Conchological Society of Great Britain and Ireland in the UK. Surprisingly perhaps, he also said that “the first syllables of *mollusk* and *malacology* are conveniently similar.” Having gone over much the same ground as I had previously, he admitted his arguments in favour of *malacology* were “slender” but considered the case for *conchology* was no better. “To me, a biologist,” he said, “the term *malacology* is preferable to *conchology* for the modern branch of zoology concerning mollusks.” To me, more a historian than a biologist,

the term *conchology* is preferable. Perhaps we should agree to differ!

Resolution - of a sort

It is curious that two conflicting, although possibly synonymous, terms have long been and still are in use for the study of one of the major divisions of the Animal Kingdom. There could be a simple reason for this. Someone with an essentially scientific appreciation of mollusks - and possibly an associated career - is more likely to favour *malacology* and may want to be known as a *malacologist*. On the other hand, someone for whom the appeal of mollusks, especially their shells, is essentially aesthetic, may favour *conchology* and be happy to be known as a *conchologist*, or even a ‘shell collector.’

That things were seen differently a century ago is obvious from the following statement, published by the Brooklyn Conchological Club. “With us,” it said, “the word *conchology* is not limited in meaning to the study of shells only, but extends to the study of mollusks in general, both recent and fossil; and the word *shell* is often used as a synonym of *mollusk*.” (Anon, 1907) This could have been written by Deshayes himself – or me! In 1966 I came down on the side of *conchology* and am happy to remain there. Probably Robertson would be equally content to stand by what he said in 1990. Mindful of these two contrary views, I have nothing more to add to the debate but a tongue-in-cheek aphorism. *Conchology* is what you do if you like shells: *Malacology* is what you do if you've been to university!

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I am most grateful to Tom Eichhorst for taking a close interest in my article and especially for pointing out the probable connection between publications by da Costa and Favart d'Herbigny.

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Conch shells on coins

Jesse Todd

Photographs by Lance K. Trask

It is interesting that of the coins of the world that display shells, the majority display conch shells. Of course conch shells are usually large and, in most cases, quite beautiful. In this article coins displaying conch shells are illustrated and I present some of the major uses of these shells by various cultures. Humans have been fascinated with and used marine as well as terrestrial shells for over 10,000 years and, for Lance and I, we believe the people had and have excellent taste. [Editor: Recent research has pushed back this date to at least 40,000 years ago and possibly earlier still.]



Figure 1. Coins with Triton shells from a) Vanuatu, b) Seychelles, c) Maldives, and d) the Cook Islands.

Charonia sp.

The triton shell is portrayed on most of the coins used in this article. The shells come from Pacific Islands and islands in the Indian Ocean where they were often used as trumpets. *Charonia* species used in such a manner include *C. lampas* (Linnaeus, 1758), *C. variegata* (Lamarck, 1816), and, most often, *C. tritonis* (Linnaeus, 1758). The sea god Triton, for which the species *Charonia tritonis* is named, is often depicted blowing a shell trumpet. Such trumpets were used in the Mediterranean area, the Pacific Islands and Japan, as well as other places. Triton shells were used as trumpets in Italy as far back as the Neolithic (circa 5150 B.C.). In the oral tradition of the people of western New Guinea, Snake blows the Triton shell and tells the people that since they struck him, he will lie in wait to bite them. In many Pacific Islands, the conch shell was blown as a sign of war, a sign of victory, and in announcing the presence of the chief. Triton

shell trumpets are usually made with the apex removed (Figure 2), but some Pacific Islanders perforate the shell and blow the shell sideways as illustrated in Figure 3.



Figure 2 (above). Man blowing conch shell at the apex, as shown on a portion of a post card from Hawaii.

Figure 3 (below). Man blowing conch shell trumpet from hole in the spiral portion of the shell, from a portion of a post card from Fiji.



Turbinella pyrum

Turbinella pyrum (Linnaeus, 1758) is the sacred chank of Hinduism and Buddhism. Two coins (Figure 4) portray the sacred chank and both are from areas where it is an important part of the religion. Its major function is that of a trumpet similar to the one illustrated in Figure 5. According to the *Bhagavat-Gita*, the gods had their own chank trumpets which they blew when they went to war. Krishna's trumpet was named Panchajanya. He took the shell trumpet from a marine demon. Bangles, necklaces and rings were made from the *T. pyrum* shell and it was used a currency

as well. Shell bracelet manufacturing in the Indus Valley dates to the Neolithic, circa 7000 to 6000 B.C. Rings also served the medical purpose of warding off skin diseases. The Maharaya of Travancore weighed himself as part of the coronation ritual and his weight was matched in gold coins that carried the imprint of the sacred chank shell. One can find silver coins from Dvaravati (which today is part of Thailand) on that date to circa A.D. 600 imprinted with the image of the sacred chank on EBay.

In China, the Spirit of the Conch Shell (the sacred chank) controls the weather and protects against sea dangers. In Tibet, every sailor carried a shell to blow to frighten away the sea dragon which overturned ships.



Figure 4. Coins portraying the sacred chank from a) Travancore and b) Bhutan.



Figure 5. Trumpet made from *Turbinella pyrum*.

Strombus gigas

Strombus gigas Linnaeus, 1758, is portrayed on a coin from the Bahamas (Figure 6) where it is a major food resource. Like other large gastropods, *Strombus gigas* was often used as a trumpet. In Andean prehistory, the sound of the *Strombus* trumpet represented a god speaking and the conch was blown at ceremonies by the Aztecs. At interior temple sites in Mexico, *Strombus* images were carved in stone and were votive offerings (along with other marine shells). Since the Aztec capital was inland, they brought the ocean to them. The *Strombus* is especially associated with Quetzalcoatl who went to the underworld, blew the conch shell, and brought humans back to life. During the ceremony to Tlaloc for rain in the Central Highlands of Mexico, the *Strombus* shell was used like a boxing glove by the Maya. The resulting bloodletting was considered an important part of the ceremony. The outer lip of the *Strombus* shell was used to make celts and adzes (hand axes) and the columella was used to make gouges.



Figure 6. *Strombus gigas* image on a coin from the Bahamas.

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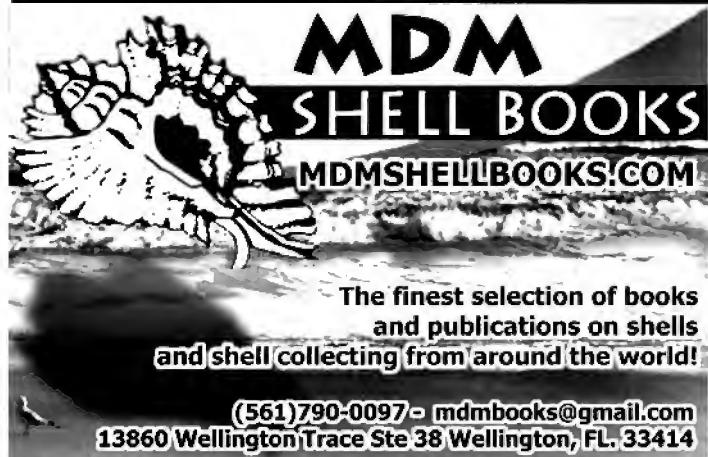
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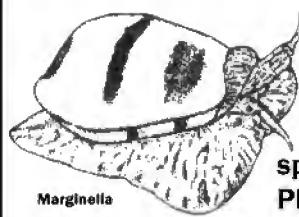
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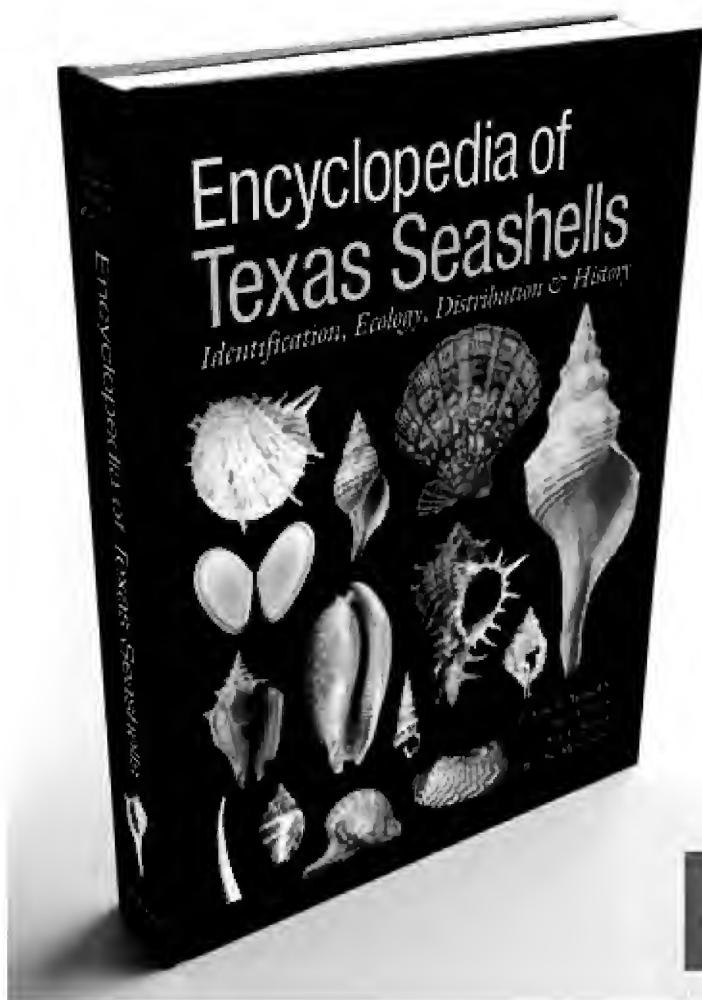
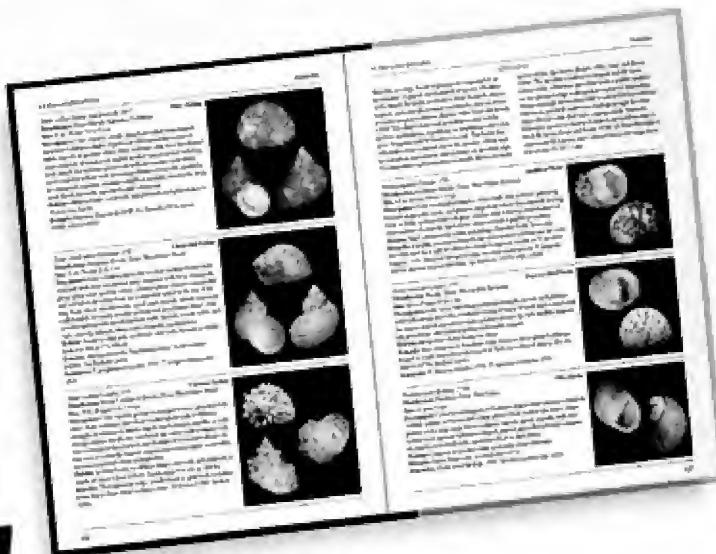
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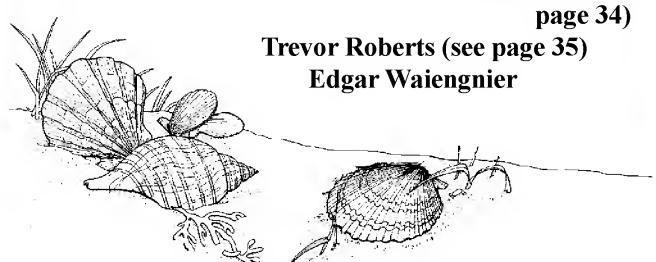
Katherine "Bobbi" Cordy (see page 33)

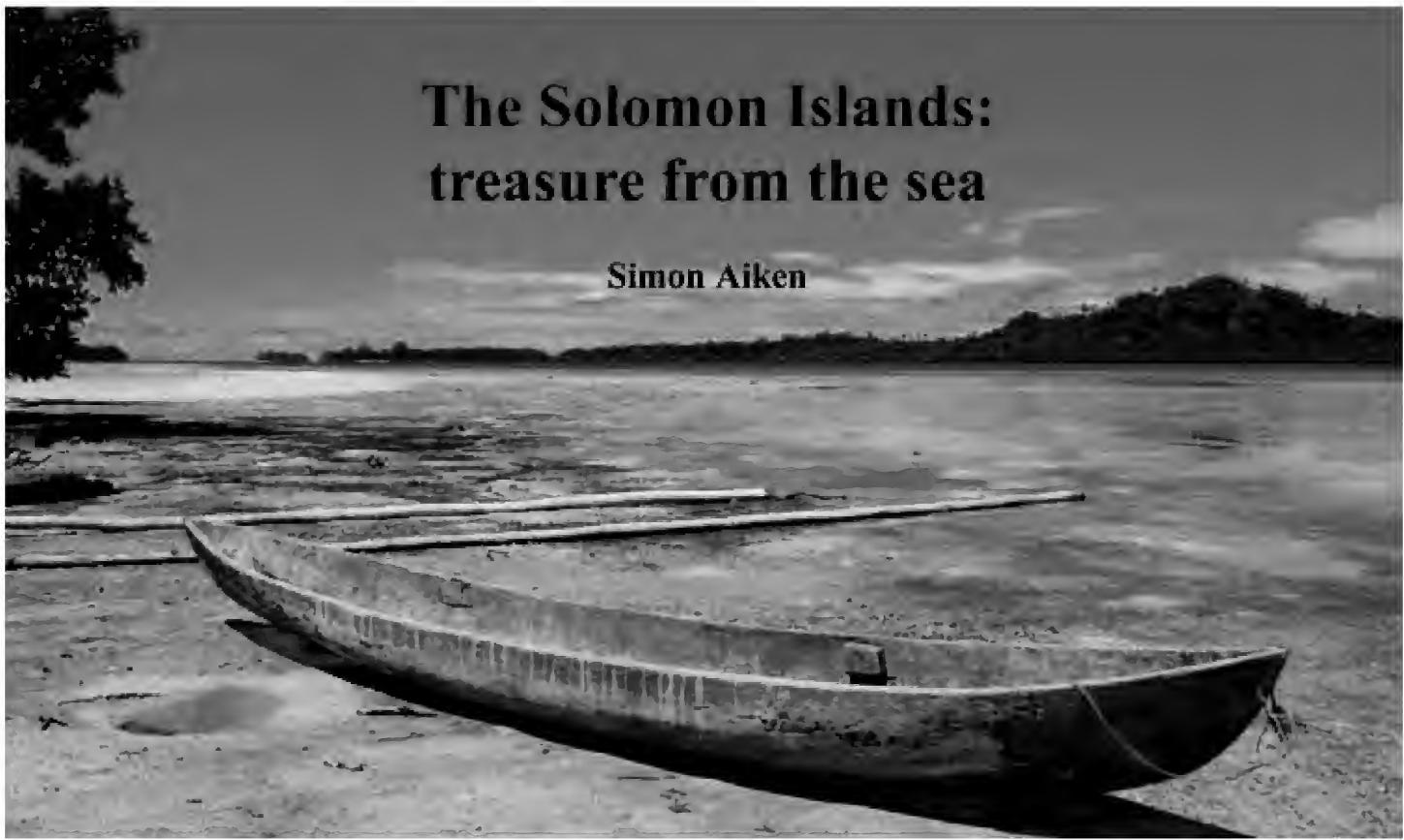
Carol Belle Stein (see page 33)

Emmanuel Guillot de Suduiraut (see page 34)

Trevor Roberts (see page 35)

Edgar Waiengnir





The Solomon Islands: treasure from the sea

Simon Aiken

When the Spanish explorer Don Álvaro de Mendaña ‘rediscovered’ this archipelago in 1568, he believed he had found the source of King Solomon’s fabled treasure. Mendaña’s dreams were soon tarnished, and he died of malaria shortly afterwards, but the Spanish name “*Yslas de Salomon*” stuck. I visited the Solomon Islands in August 2010 in search of molluscan treasure.

Jet travel has made trips to the Solomons easier than was the case in Mendaña’s time, but still grueling. Visitors arrive in the capital, Honiara, from Brisbane, Australia. For European shell collectors, Brisbane is the opposite side of the globe, so the long-haul flights are then followed by a ‘backwards’ flight over the Coral Sea to the Solomons. The round-trip from Europe requires a daunting six days of travel and visitors from North America fare little better. More adventurous souls than I may opt to fly to Papua and make their way by sea canoe to the northernmost island groups of the Solomons – a traditional trading route, but fraught with dangers.

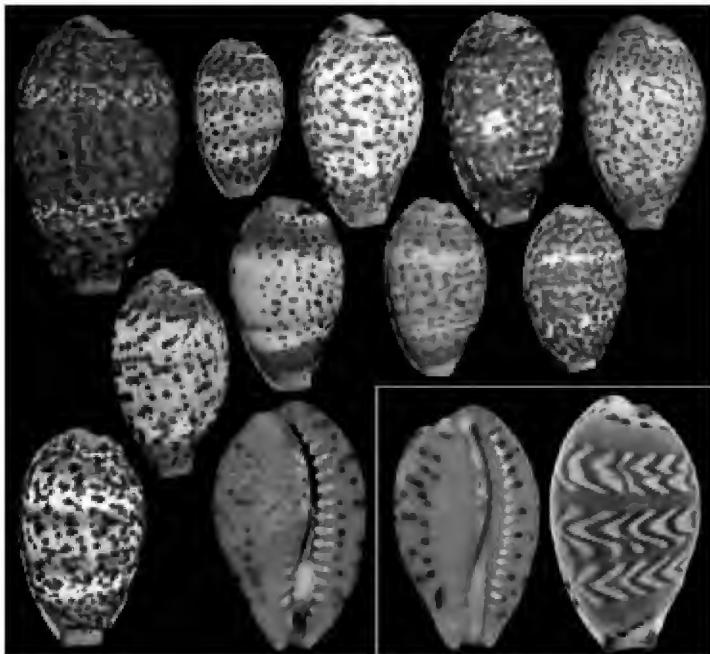
The 922 islands that make up the Solomons have a combined land area somewhat less than the state of Maryland. It is their 3,300 miles of coastline that is the main attraction for shell collectors. There are mangrove swamps and extensive lagoon areas. The larger islands like Guadalcanal are ruggedly mountainous and densely forested - challenging habitats for landsnail collectors to explore.

Transport between islands is usually by canoe, even for worryingly long journeys. The traditional ‘dug-out’ canoe in the picture above was my principal means of transport around Marau Sound, in the south of Guadalcanal. This was one of the more seaworthy vessels I used, although it paid to be handy with the ‘baler’ ...

Most conchologists, amateur and professional, have their ‘wish list’ of countries they’d like to visit. I have *my* list, and it’s long. So, why the Solomons? A decade ago I was obtaining a good range of shells from the Solomons, but the flow then ‘dried up’. I wanted to see for myself whether these islands were still a potential treasure-trove of shells and to find out why the shells were no longer coming out.



(Above) Most of the islands in the Solomons archipelago are low-lying coral atolls with shallow-water lagoons. Although transportation to most of these islands is problematic, such localities are rich molluscan habitats and can be a paradise for snorkelers. This picture was taken while flying over the Solomon Sea and shows Kisa, Lologhan, and Laumuan Islands, in the Russell Islands group.



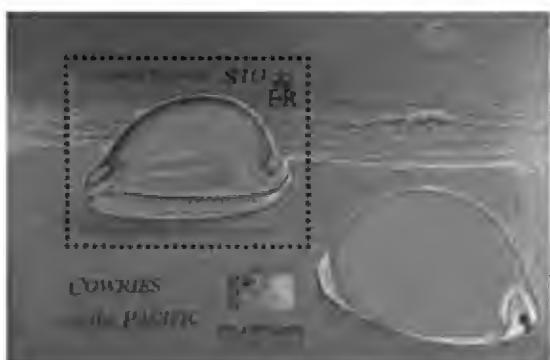
(Above) *Palmadusta humphreysi* (Gray, 1825) from Marau Sound. The variation in color, pattern, and size (smallest 12.6mm, largest 22.3mm) is striking. These specimens are from a small area near Simeruka Island, collected at night by snorkeling. *P. ziczac* (L., 1758), shown at bottom right, is a closely related species from the same locale (19.4 & 20.3mm).

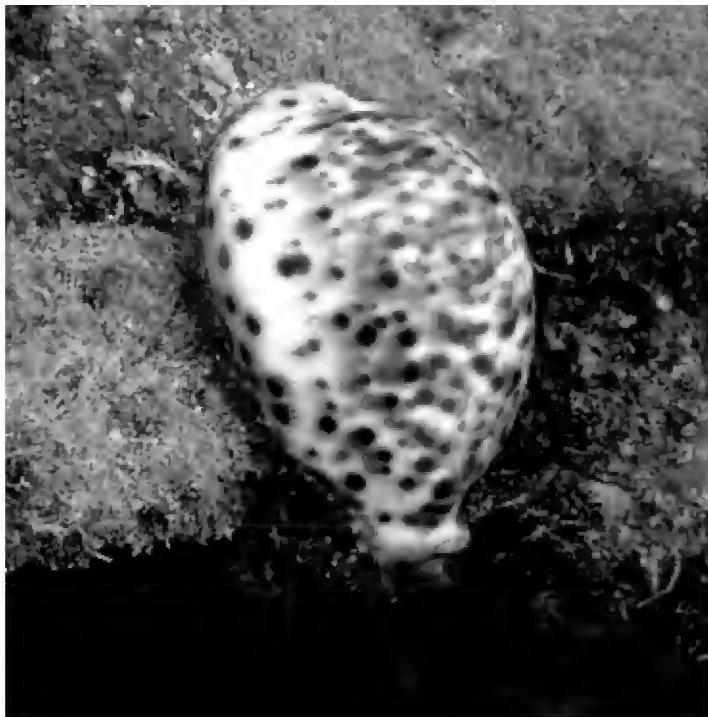
(Middle) *Lyncina aurantium* (Gmelin, 1791), the golden cowrie, selected as the highest denomination postage stamp in a special "Cowries of the Pacific" set issued by the Solomons in 2002.

(Below) A Melanesian diver displays a live *L. aurantium* he caught in Marau Sound. This shell is much rarer here than in the Philippines, but appears very similar morphologically.



(Above) In the 'Are'are language of the Marau peoples, seashells are called "puriruri." Marau Sound is a delight for Cypraea collectors. With the help of local villagers I found 35 species around just one small island. The shells illustrated here were collected by snorkeling or by turning rocks at low tide. All are illustrated to the same scale. 1. *Erosaria eburnea* (Barnes, 1824), 33.8mm; 2. *Cibrarula catholicorum* (Schilder & Schilder, 1938), 12.1mm; 3. *C. cibaria zadela* (Iredale, 1939), 16.1mm; 4. *Nucleolaria nucleus* (L., 1758), 16.8mm; 5. *Erronea caurica* (L., 1758), 38.0mm; 6. *Lyncina carneola* (L., 1758), 20.1mm; 7. *Palmadusta clandestina candida* (Pease, 1865), 20.6mm; 8. *Purpuradusta fimbriata* (Gmelin, 1791), 8.9mm; 9. *Erronea cylindrica lenella* (Iredale, 1939), 28.2mm; 10. *Pustularia margarita* (Dillwyn, 1817), 12.2mm; 11. *Ransonella punctata* (L., 1771), 10.8mm; 12. *Ovatipsa chinensis amiges* (Melvill & Standen, 1915), 29.1mm; 13. *Erronea chrysostoma* (Schilder, 1927), 27.7mm; 14. *Eclogavena coxeni hesperina* (Schilder & Summers, 1963), 17.7mm; 15. *Luria isabella* (L., 1758), 15.6mm; 16. *Bistolida stolidia crossei* (Marie, 1869), 24.9mm; 17. *Erronea errones* (L., 1758), 25.3mm; 18. *Erosaria beckii* (Gaskoin, 1836), 11.4mm; 19. *E. labrolineata* (Gaskoin, 1849), 16.8mm; 20. *E. helvolia* (L., 1758), 14.4mm; 21. *Bistolida kieneri depriesteri* (Schilder, 1933), 13.8mm; 22. *Palmadusta asellus* (L., 1758), 21.2mm; 23. *Staphylaea staphylaea consobrina* (Garrett, 1879), 13.6mm; 24. *Melicerona listeri* (Gray, 1824), 16.2mm. Also collected in this locality but not shown: *tigris*, *mappa panerythra*, *arabica*, *mauritiana*, *teres*, *moneta*, *erosa*, *aurantium*, *annulus*, *humphreysi*, *ziczac*.

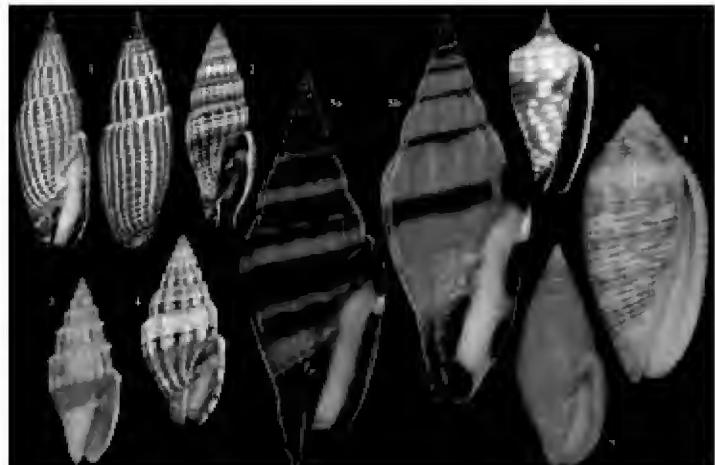




(Above) *Cypraea tigris* L., 1758, forages on the wreck of a WWII American transport boat off New Georgia, where shipwrecks and plane wrecks lie within reach of snorkelers. Surprisingly, there is little organized SCUBA diving and not much effort to attract foreign visitors to these sites.

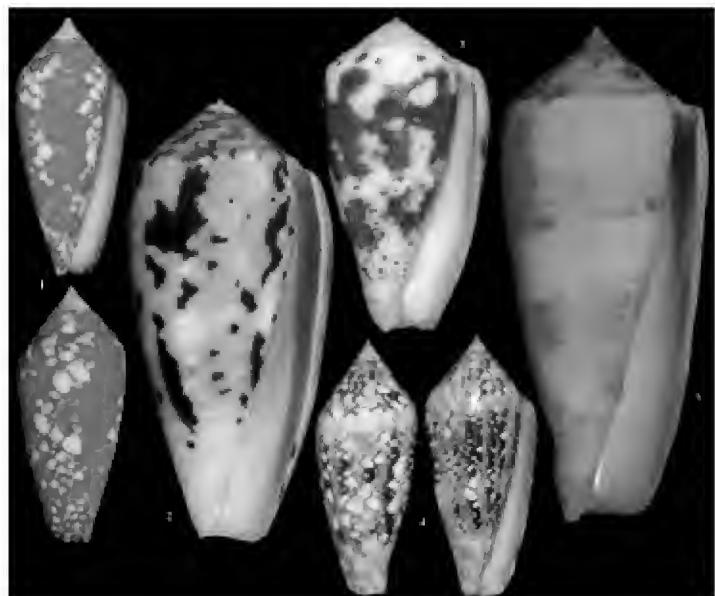
The Solomons has a turbulent history. Polynesians started arriving here 800 years ago by canoe; they were probably disappointed to find the major islands already settled by Melanesian peoples. The racial tensions between Melanesians and Polynesians continue to this day, and disputes over land ownership have never been forgotten. I came to know many Melanesian people in Marau, who regard themselves as the ‘original’ settlers of Guadalcanal. Their lingering resentment towards other settlers is still apparent. Attempts by Europeans (mainly the British) to ‘colonize’ the Solomons eventually put an end to ‘head-hunting’, yet neither the natives nor the British can have felt satisfied with the subsequent developments. In one extreme example from 1927, some Kwaio tribes people of Malaita Island killed a tax collector and his armed guards; the reaction of the self-styled ‘colonialists’ was to send a punitive expedition (including a battleship!) that killed or captured hundreds of Kwaio, desecrated and destroyed sacred tribal sites, and set up a situation that foments bad feelings that last even today. The tribes people can be forgiven for their suspicions about European-style ‘diplomacy.’

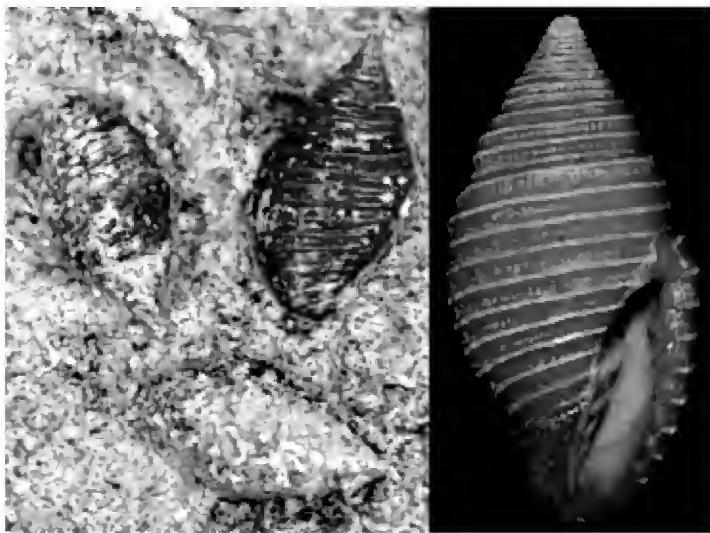
The Solomons gained independence in 1978, but the 21st Century started with five years of what is best described as civil war. Territorial disputes, particularly on Guadalcanal, led to hundreds of deaths, tens of thousands of refugees, a bankrupt government, and economic devastation. In 2001 the government, such as it was, asked for outside help to quell the violence. Shell collecting was simply not a priority. Australian shell collectors who used to visit were now warned not to go. With no visitors buying shells, the Solomon Islanders just had no reason to search for the ‘collectible’ species.



(Above) The sandy bottom of Marau Sound is a fertile hunting ground for miters. 1. *Vexillum rubrocostatum* Habe & Kosuge, 1966, 27.8 and 27.9mm; 2. *V. antonellii* (Dohrn, 1861), 23.8mm; 3. *V. coronatum* (Helbling, 1779), 21.1mm; 4. *V. semifasciatum* (Lamarck, 1811), 22.3mm; 5. *V. vulpecula* (L., 1758), 43.9 and 45.1mm (5a seems to be an unusual localized color form); 6. *Imbricaria conularis* (Lamarck, 1811), 20.3mm; 7. *Mitra pellisserpentis* Reeve, 1844, 24.6mm; 8. *Pterygia crenulata* (Gmelin, 1791), an unusually inflated specimen (31.0mm).

(Below) Cones are so characteristic of the Solomons that their current series of definitive postage stamps features only cones – 14 different species on the 14 denominations. Although the Solomons has few true endemic *Conus*, several quite desirable species are easier to obtain here than elsewhere. These specimens are from Marau Sound: 1. *Conus crocatus* Lamarck, 1810, 25.8mm; 2. *C. floccatus* Sowerby, 1841, 43.5mm (a marvelously variable species); 3. *C. striolatus* Kiener, 1845, 29.5mm; 4. *C. legatus* Lamarck, 1810, 24.8 and 25.2mm; and 5. an unusual form of *C. consors anceps* A. Adams, 1854, 50.5mm. *Conus gloriamaris* Chemnitz, 1777, is found close to Honiara, but in very difficult conditions for divers: the black sand bottom is stirred up by river run-off and the area is all-too-popular with saltwater crocodiles!





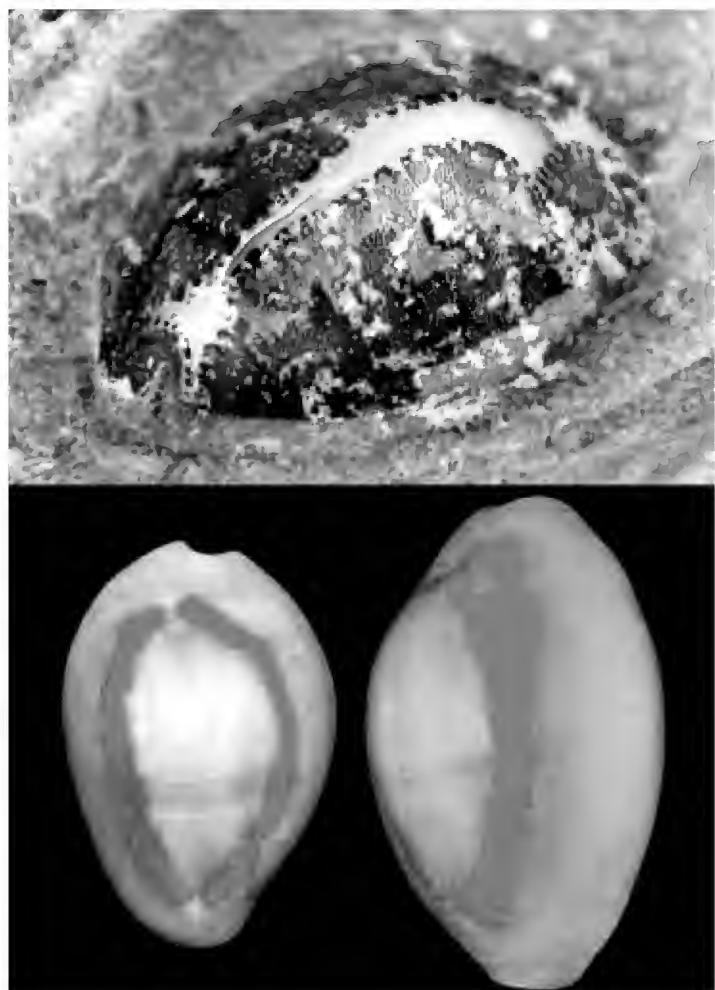
(Above) Turning a rock at low tide in Roviana Lagoon in the Solomons' Western Province reveals a cluster of *Mitra tabanula* Lamarck, 1811. After cleaning, the shell's beautiful sculpture is revealed (15.4mm specimen, right).



(Above) In my quest for 'bana' (seashells, in the Roviana language), I turned an intertidal rock and found this *Mauritia arabica* (L., 1758) guarding its eggs. Naturally, the rock was immediately put back after one photo.



(Above) This 75mm specimen of *Cymatium pileare* (L., 1758) is almost invisible against its environment in Roviana Lagoon (left picture). On the right is the same shell, turned to show its aperture.



(Above) The shallow waters around New Georgia Island in the Western Province are a haven for opisthobranchs. The species I saw most commonly was *Chelidonura varians* Eliot, 1903 (family Aglajidae), which is active on sandy bottoms during the day. This species actually has an internal shell.



(Facing page) These ‘rusty’ *Mauritia arabica* (43.7–57.7mm) were collected in a few feet of water, on an American shipwreck in Roviana Lagoon. This wreck actually breaks the surface at the lowest tides. The rust coloration is very pronounced in some specimens and a few are ‘over-glazed’ so as to appear almost grey. The shell at the upper left (35.5mm) is a normally colored reef specimen for comparison. Just a few miles away is the small island where a certain Lieutenant John F. Kennedy swam ashore in 1943, after the sinking of his PT boat.

DID YOU KNOW?

Swimmers today owe thanks to a young Solomon Islander named Alick Wickham. Alick used a special swimming stroke he had developed in Roviana Lagoon when he visited Australia in 1920. The top swimmers were impressed and started to copy it. We now call his swimming stroke ‘front crawl’.

(Below) Sycamore Bea from Munda examines a truly ‘gigas’ specimen of *Tridacna* in Roviana Lagoon. The bright blue mantle of this same individual is shown on the back cover of the September 2010 *American Conchologist*. This area was particularly badly hit by a tsunami on April 2, 2007, caused by a powerful undersea earthquake. It was reassuring to see the variety of healthy marine life 3½ years later.



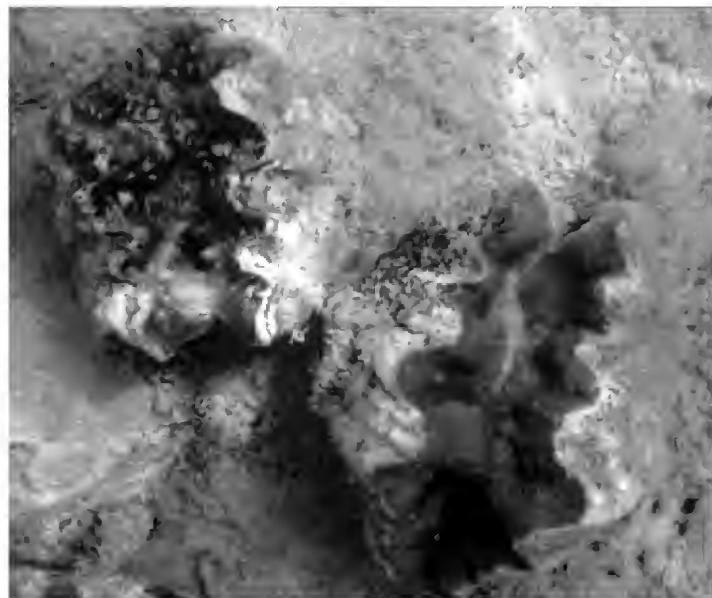
Tridacna gigas (L., 1758) has traditionally played an important role in the life of the Solomon Islanders, and continues to today. Known locally as ‘hio,’ it is an important source of protein for the Roviana people. The shells are often carved, most notably into ‘shell money.’ Discarded shells litter the seashore and I saw a children’s ‘play-pit’ filled with *Tridacna* shells.

Visitors to the Solomons should be wary of the products made from *Tridacna* that are offered as souvenirs. Tridacnidae are protected by CITES and there would be heavy penalties for attempting to export these shells without proper documentation. Any artifacts containing shell product whatsoever must be declared and inspected on arrival back in Australia.



(Above) A young *Tridacna* lodges in the reef near Kiambe Island in Roviana Lagoon. All the recognized *Tridacna* species are found in the Solomons, and the living animals can be difficult to identify. The clams incorporate living algae in their mantle tissue (endosymbiosis), providing nourishment through photosynthesis. The algae can be clearly seen in this picture.

(Below) These *Tridacna gigas* are part of a ‘family group,’ sitting beside the shell shown on the left. At 300–350mm, they are dwarfed by the larger specimen. Even in such a discrete group, there is considerable variation in mantle color.



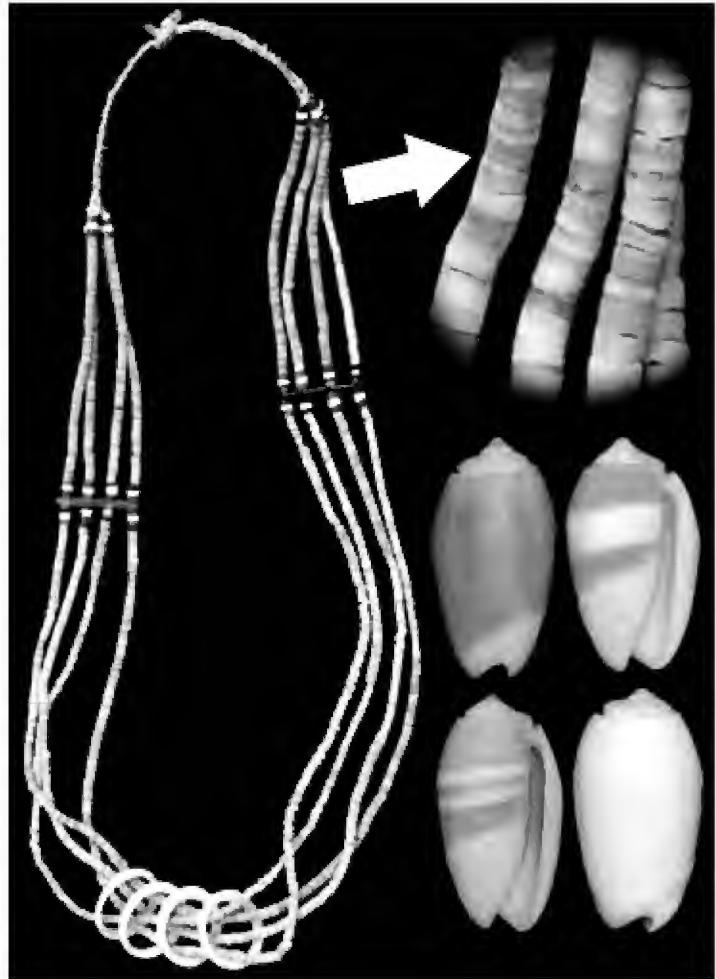
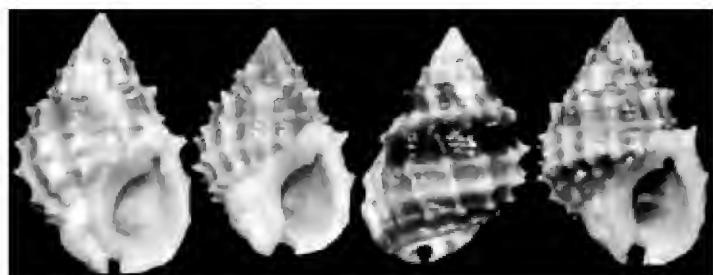


(Above) The Roviana people make 'bakiha' from *Tridacna gigas* shells, which is used as a form of money. The non-commercialized societies in the Solomons started using currency only recently and the tradition of shell money remains strong. Special grinding tools are used to carve the massive shells, a time-consuming labor, and the *bakiha* shown here would be the prize possession of a Solomon Island family. The rings can be worn on the wrist or hung round the neck.



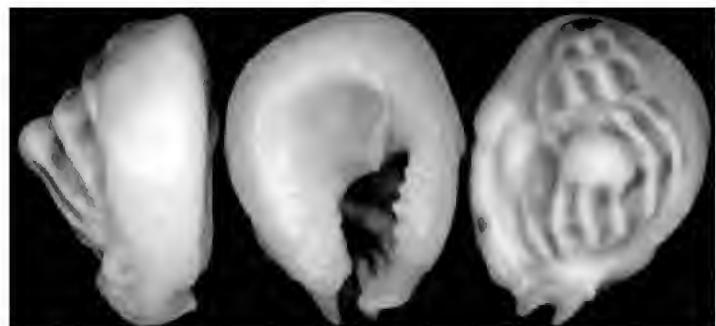
(Above) Mangrove whelks or mud creepers (*Terebralia palustris* L., 1767) are stacked in heaps in the Honiara market. The price is charged for one heap, but they freely redistribute themselves between heaps - to the frustration of the vendor! Despite the awareness of mollusks as a food source, there is no tradition here of collecting shells specifically for conchologists.

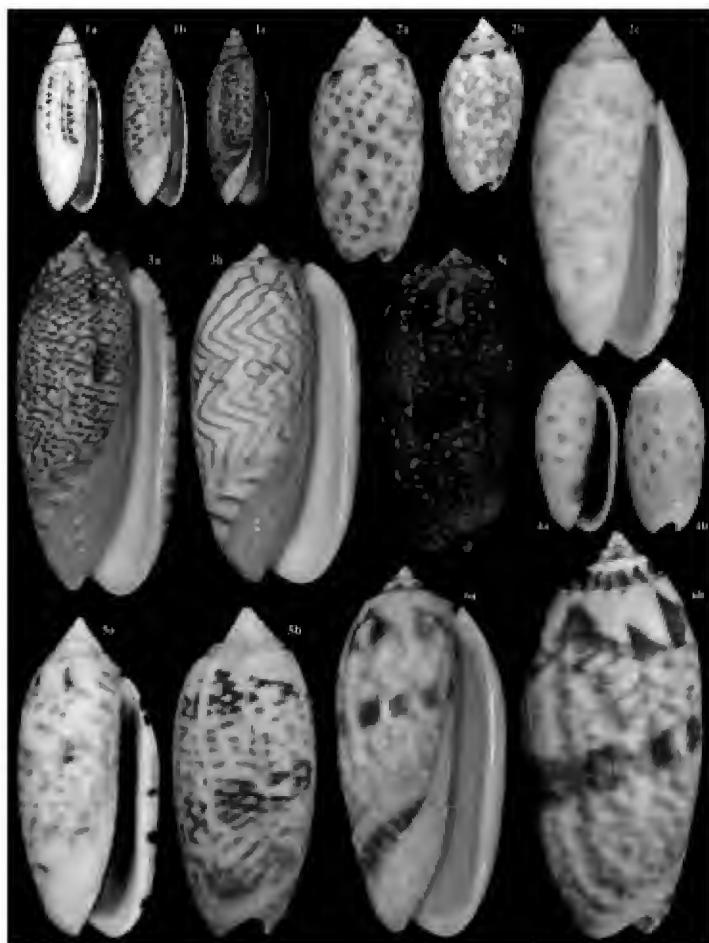
(Below) *Nassarius horridus* Dunker, 1847 exhibits surprising color variation in this selection from Roviana Lagoon.



(Above) The Marau people of southern Guadalcanal make a completely different form of shell money, called 'hikahika.' It is still sometimes used to 'buy' a bride, or to buy property. As westerners might say, "time is money," and it is the time required to create these pieces that translates into their value. *Oliva carneola* (Gmelin, 1791) are painstakingly ground down, one at a time, to form small 'cylinders' that can be strung on a cord. The 'spacers' are made from turtle shell. Also shown here are four forms of *O. carneola* collected in Marau Sound, including an albino.

(Below) The women of New Georgia collect *Nassarius camelus* von Martens, 1897, which are exported to New Britain. This curious little species, rarely more than 8mm, is then used as money by the indigenous Tolai peoples.





(Above) Besides the abundant *Oliva carneola*, the Solomons boasts a variety of beautiful Olividae. On this trip I collected: 1. three color forms of *O. longispira* Bridgman, 1906, 23–24mm (now considered a full species); 2. *O. amethystina* (Röding, 1798) (showing huge size variation: 22–43mm); 3. *O. reticulata* (Röding, 1798) (3a is form *azona* Dautzenberg, 1927, 43mm; 3b is form *zigzag* Perry, 1811, 46mm; 3c is an unusually dark specimen, 39mm); 4. *O. tessellata* Lamarck, 1811, 22mm; 5. *O. caerulea* (Röding, 1798), 41 and 42mm (showing color variation); and 6. *O. miniacea lamberti* Jousseaume, 1884, 48 and 52mm. All are shown to the same scale.

My Solomon Island travels took me from Guadalcanal to the town of Munda in the Western Province. Munda has a population of barely 4000, and a paved runway suitable for wide-bodied jets. This anomaly is because Munda was a center for military activity during WWII. Indeed, Munda experienced some of the fiercest fighting in the Pacific, in 1942/3, largely because its airfield offered the Japanese a staging point to attack ‘Henderson Field,’ the country’s principal airfield. Today, much of the surrounding lagoon area is a designated “Marine Protected Area,” where no shell collecting or fishing is allowed. The rusting remnants of the fighting are easy to find, both in the water and on land. Much military equipment was scuttled or unceremoniously ‘dumped’ in these waters, unwittingly providing many artificial reefs for marine life.

The Solomons remains a relatively undeveloped country. For the shell collector, this means that boats capable of pulling



(Above) The seaweed *Kappaphycus alvarezi* lays on large outdoor tables on an island in Marau Sound. Some Solomon Islanders have recently started cultivating seaweed, which is sold in China for use in foods, pharmaceuticals, and traditional medicines. Aquaculture is a promising new strategy for these islanders.

a dredge are hard to come by and there are few compressors for SCUBA gas. Good shells have certainly been obtained by dredging here in the past, but the so-called ‘tensions’ of the early 2000s caused a loss of interest. Other drawbacks for collectors are the surprisingly heavy seas (even in ‘sheltered’ lagoons), cyclones, human-eating sharks, and – of course – copious saltwater crocodiles. There are barely 20 miles of paved roads in the entire country, so water transport and ‘bushwhacking’ are essential for exploring the Solomons.

Notwithstanding the devastating 2007 tsunami and despite the ethnic tensions, the Solomons retains much of its allure for shell collectors. Based on my direct observations, the native islanders show respect for their marine environment. They recognize the importance of human interaction with marine ecosystems and willingly work with the authorities to preserve what is unique.

A serious book devoted to Solomon Island seashells is long overdue. The landsnails of the Solomons are now receiving the scholarly attention of André Delsaerdt, with volume 1 of “Land Snails on the Solomon Islands” published by L’Informatore Piceno in 2010 and volume 2 expected this year. In a future article, I shall illustrate my own experiences collecting landsnails in the Solomons.

I wish to thank the villagers of Suhu, Vutu, Hautahe, and Simeruka, the people of Munda and its neighboring villages, and the Peter Joseph WWII Museum near Kiapatu. I also thank Markus Huber, Felix Lorenz, Jean-Claude Martin, Giancarlo Paganelli, and Dennis Sargent for their valued advice.

All photographs appear courtesy of Simon’s Specimen Shells Ltd (www.simons-specimen-shells.com).

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The 2010 Philadelphia Shell Show

Paul Callomon

The 28th Philadelphia Shell Show was held on Columbus Day weekend and was a great success by any measure. It was the largest yet, with over five hundred feet of exhibits, and the quality of the displays reached new levels. One of the hallmarks of the Philly show is the balance of art and science, and this year saw strong entries from both sides. The scientific displays tackled many different themes and some visitors were surprised to learn that this was not a professional museum exhibit but an amateur show!



Guests at the supper enjoyed a cocktail hour in the Academy's newly refurbished main lobby before moving into Dinosaur Hall to eat. Photo by Mike Gage.



The Academy's Department of Malacology fielded several exhibits, including this one on the Pearly Nautilus. Photo by Paul Callomon.

The main science awards were:

- R. T. Abbott Award: Ed Shuller & Jeanette Tysor, "Mystery of the Migrating Mollusks"
- Robert B. Fish Award: Michael Gage, "Shells of Hawaii"
- Leonard Hill Award: Tom Grace, "Maurea of New Zealand"
- DuPont Trophy: John & Darlene Schrecke, "True Conchs of the World"
- COA Award: Karen VanderVen, "Volutae of the Tropical Western Hemisphere"
- Masters Award: Gene Everson, "Seashells of the New Millennium"



Spectacular Sailor's Valentines continue to be a major feature of the Philadelphia Show.

On the art side, great new work was displayed in several categories including photography, shell flowers, shell pictures, and mirrors.

The principal art awards were:

- Best Single Sailor's Valentine (non-professional): Beverly Hartzell, "Objets Trouvés"
- Best in Show – Traditional Single Sailor's Valentine: Gerda Reid, "Dancing Flowers"
- Best in Show – Contemporary Single Sailor's Valentine: David Rhyne, "Springtime"
- Best in Show – Objets Trouvés Single Sailor's Valentine: Wendy Marshall, "Fruits of the Sea"
- Best in Show – Double Sailor's Valentine: Jane Santini, "May You Walk Gently"
- Best Artistic Exhibit (excluding Valentines, non-professional): Lisa MacDonald, "Tidal Pool"
- Best Artistic Exhibit (excluding Valentines, professional): Constance Marshall Miller, "Scratchboard Drawing"
- Best Shell of Show: Patricia Whitaker, *Angaria sphaerula*
- Best Self-collected Shell of Show: Gene Everson, *Conus theodorei*
- Judges' Special Awards (Scientific): Nick & Betty Ruggeri, "The Clams that Nobody Loves" and Robert and Happy Robertson, "Gastropod Coiling"
- Judges' special awards (Artistic): Lindsey Rafter, "Flowers and Fish"; Constance Marshall Miller, "Snowy Egret"; Carolyn Mirkil, "Flowers in Vase" and Michele Gilmartin, "Beautiful Bounty".

The Preview Party on Friday evening was a huge success with over 150 guests browsing the bourse and viewing the show. The Phillies were in the playoffs that night (third year running), which might have represented a dilemma for some, but happily a live feed to the game was laid on! The evening raised \$30,000 for the Center for Molluscan Studies and the Academy's Department of Malacology.



(Above) The venue was the Academy's purpose-built Changing Exhibits hall. Photo by Paul Callomon.



(Above) Dealers at the show included (from left) (top row) Brian Hayes, Don Pisor, Don Dan and Rich Goldberg (middle row) Bob and Betty Lipe, Bev, Al and Neal Deynzer (bottom row) Rich Eisenman, Rick Negus, Sue Hobbs and Phil Dietz

(Below) The bourse was the center of attention for many, with a fabulous display of riches. Photo by Michael Long.



(Above) Gary Rosenberg and Bill Lyons try to decide whether they agree with what Pilsbry is saying. Photo by Mike Gage.

(Below) Academy Curator Emeritus Robert Robertson with wife Happy recalls all the Philly Shows he's seen. Robert was the only person present to have actually heard Henry Pilsbry in person! Photo by Paul Callomon.



For 2011, the show moves one week earlier. Setup, judging and the Preview Party will be on Friday, September 30, and the show will be open to the public on Saturday and Sunday, October 1 and 2. Watch the club's web site www.phillyshellclub.org for updates, entry forms and news of the show!

More pictures of the 2010 show can be found at:
<http://fotograffic.net/ShellShowRough/index.html> and Randy Allamand has posted some at
<http://www.facebook.com/album.php?aid=2092340&id=1482615077&l=327b4f902d>



2010 PHILADELPHIA SHELL SHOW

Supper guest speaker

Dr. Henry Augustus Pilsbry

On The History of Zoological Nomenclature

HENRY AUGUSTUS PILSBRY (1862-1957) ranks among the most productive malacologists of all time, and described more new taxa than anyone else. He spent his entire professional career at the Academy of Natural Sciences in Philadelphia, starting in 1887 as an assistant to the head of the Conchological Section, George W. Tryon. Besides his work with mollusks, Pilsbry published on Crustacea and was an acknowledged authority on barnacles. During the first four decades of his career he undertook simultaneously to continue the publication of Tryon's vast Manual of Conchology, while founding and serving the journal *Nautilus* in the roles of editor, publisher and major contributor and producing several books, including the Catalogue of the Marine Mollusks of Japan (1895). Pilsbry became Curator of Mollusks and Professor of Malacology, and continued to research and publish until days before his death in 1957. Among his best known works is the four-volume Land Mollusca of North America (1939-48), which remains in general use today.

Pilsbry gave lectures on Malacology at the Academy, and at least one of them was preserved using a Wire Recorder. This now vanished technology transferred sound by a magnetic analog process onto a steel wire as thin as a hair. The wire ran past the recording head at a rate of two feet per second, which meant that a length of roughly 1.4 miles was required for a one-hour recording. So fine was the wire, however, that even this length would fit onto a drum six inches in diameter. Wire recorders were popular for home recording in the late 1940s and early 1950s but were displaced by audio tape, which offered higher fidelity and stereo capability. The durable, fire-proof steel medium nevertheless lived on into the 1970s in aviation flight recorders.

The sound quality of the Pilsbry wire is remarkably good, given its age. He occasionally strayed away from the microphone and thus became less audible, but his clear delivery and an impressive command of English make him very easy to comprehend. A transcript of the full talk follows. Where a passage is marked [...], it is not clear enough to determine the words. Otherwise, the punctuation used here is deduced from Pilsbry's grammar. There is a brief introduction at the beginning of the recording, but who the female speaker is has not been determined.

In a notable passage, Pilsbry asserts that the fossil record shows the evolution of species to occur in steps, rather than as a continuous process. This notion would later form the basis of the theory of "punctuated equilibrium" advanced by Niles Eldredge and Stephen Jay Gould in 1972, building on earlier work by Ernst Mayr at Harvard and I. Michael Lerner at Berkeley. Pilsbry had clearly reached similar conclusions somewhat earlier.

Acknowledgments

Assistance with arranging the digitization of the original wire was provided by Clare Flemming of the Academy Archives, where the wire and another like it are now stored. Dr. Gary Rosenberg kindly reviewed the transcription and elucidated many of the ambiguous passages and obscure references. Digitization was by Avocado Productions of Broomfield, CO. Post-editing, initial transcription and preparation of this publication were by Paul Callomon.



(Above) Henry Augustus Pilsbry and staff (early to mid 1900s).

(Below) The spool of wire used to record Dr. Pilsbry's talk.



[Introduction]

...define how a name should be given to a group of animals or plants, and there have been many changes in the past. Zoological rules and botanical rules differ still on many points, as you will see this morning. However, I think in general the aims of all rules of nomenclature are to attain a set of – shall we call them “laws” – by which the fixity of a name is asserted; also, to have the rules simple and clear and to cause as few upsets in already common usage as possible. I think those might be summed up as the main aims of the people formulating the rules of nomenclature. Now this morning, Doctor Pilsbry, who is Curator of Mollusks at the Academy and one of the foremost taxonomists of the world, is going to talk to us concerning zoological nomenclature.



IT IS OF COURSE OBVIOUS that work in zoology and botany can be carried on only with a systematic plan of nomenclature. This has to be simple enough to be readily understood, and sufficiently impartial to be a – to obtain international use. Now every language has, of course, its own nomenclature of animals and plants, adapted to everyday needs; and this nomenclature is primarily unnominal. When a more specific characterization is desired, it becomes binomial. For instance, we have the general idea of “boat,” and if you wish to be more specific you say “steam boat” or “sail boat” or “row boat.” It was exactly this binomial system that Linnaeus adopted about two hundred years ago for the scientific nomenclature of plants and animals. Latin was then the common language of all learned men, and being a dead language it was adapted for international use without prejudice. Now the idea of a binomial nomenclature wasn’t wholly original with Linnaeus; it did not come from his mind as Minerva sprang from the brain of Jove. It was a gradual – there was a gradual leading up to it in the works of the naturalists previous to him, and it may be well to give a – some brief account of the history of nomenclature scientifically. Now, prior to Linnaeus, there was no uniformity. Each writer had his own system, and he designated species of animals or plants by the plan which he thought was best without definite reference to what other people had done. The usual way was to – instead of a name for a species, to give a descriptive phrase. Now, for instance, in Sir Hans Sloane’s History of Jamaica, published in 1725, a book which I have here, you will find the different species of animals and plants are designated by a descriptive phrase. For instance, where I happened to open that book yesterday, Sloane was describing star-fish, and his first species he designated as [...] series of starfish he called *Stella marina minor echinata purpurea*; and the second species was *Stella marina maxima articulatus cinerea*.¹ Well, this was rather a clumsy way; to have such a long phrase every time you wish to speak about a certain starfish, which he later in his work described fully and illustrated.

Now, this was the general rule. The authors of that period used a more or less lengthy descriptive phrase to designate the different species; and while most of them had this phrase in Latin, a good many used their native tongue: Dutch, French and – so that every species that was at all well known came to have half-a-dozen or more different names in the works of different writers. But the idea of more definite names was being considered by authors of the early part of the 1700s, and they had the idea of grouping together closely related species under what was – they called the “genus.” Now “genus” of course is a Latin word meaning the descendants of a common stock, and that is just what they considered the species of one genus to be, the descendants of one common stock, and

that is what we still – that is still the idea of a genus. In the early works of Linnaeus and the works of Tournefort in Botany, and of Adanson and many others in Zoology, this idea of a genus was – was being brought up. They still used a polynomial “many-word” description to designate the species, or in the case of Adanson he used a single word for each species, but it was not a Latin word; for instance, “Mytilis” for the oysters, but his half-a-dozen different species were simply designated by vernacular words, not by Latin terms. But at the same time, many of the common genera were well characterized by these authors, and before the middle of the 1700s, and were well defined; so that many of the names which we date as from Linnaeus really go back to these all-but-forgotten pre-Linnaean authors. Many of their genera were simply adopted by Linnaeus and transferred into his system.

Now it was the great merit of Linnaeus that he substituted for this chaos of polynomial names for species a single word for the species. He carried out for species the same idea that had been growing up for genera, and for instance, for *Stella marina minor echinata* Linnaeus substituted the word *Asterias* for the *Stella marina*, and in place of the string of adjectives he selected one adjective for the specific name; so that this starfish, which had been designated by a phrase as long as a line across a page at least, was succinctly made into a two-word name, *Asterias echinata*. Now this – together with this reform in specific names, which was almost entirely Linnaeus’s own conception, he formulated rules for giving names to animals and plants; and before him, there had been no recognition of any rules – every author was a law unto himself and made his own rules. There was also another great advantage in Linnaeus’s work, and that was that he made it comprehensive by covering all of the animals and plants in the then-known world – known in the world at that time. This he published in – as far as animals are concerned – in a work called *Systema Naturae* and the majority of the number of animals that were known at that – in 1758 are the size of this volume, which contains succinct descriptions – names and succinct descriptions – of all of the then-known animals. There are about, well, six to ten on a page, and they can all be contained in a volume of very moderate size. However, he did not pretend in this work to give full descriptions. He gives a succinct description, and then references to the authors who preceded him who have given full descriptions of the different animals; and it may be said that many of the species of Linnaeus were based solely upon these other authors – he had never seen the animals at all. He made a compilation and gave a binomial name to the species which had been defined by many other authors; and it is by reference to the works of these older authors that we are

¹ Sloane’s first two species actually are *Stella marina minor echinata purpurea* and *Stella marina minor cinerea laevis*. The third is *Stella marina maxima articulata*. By mixing up the second and third ones, Pilsbry inadvertently illustrates his own point regarding the difficulty with such names.

able to identify many of the Linnaean species, as his descriptions are so very brief. But it was the fact that he gathered the whole known fauna in one work that aided a great deal in having a – in giving it universal currency. It was a very great convenience for people who had gone from one another of the old books and finding a different name for the same animal in each one to be able to find one definite name in the works of Linnaeus; no matter what order it was: insects, starfish, anything, why, you could find it. And while Linnaeus was primarily a botanist, he had a broad enough outlook to make a very good zoologist also, for that time. But those two qualities of Linnaeus's work: the – having every animal with a name of two terms, a binomial name, and having a regulation that a name once properly given could not be changed; that was one of the points which gave the Linnaean system a general use, over all other zoological systems of names. Now of course the Linnaean names – or regulations as to names – have been added, practically all of his provisions have been retained but various additional provisions have been made for the use of generic names [...] and all scientific names.

Now in the case of genera, names of genera are always a single word, and a substantive, preferably, which must be in the nominative and singular; and it is always written with a capital. This is a rule that you often see transgressed in newspapers and other places that write a generic name with a small letter. Also the name must be either Latin or Latin in form. For instance, if you have a name like "Hawaii" in Latin [...] ending in -ia [...]; a genus – if you wanted to name a genus for Hawaii [...] *Hawaiia*; so that any barbarous or non-Latin name has to be made into a Latin form to be acceptable as a generic name. A great many generic names are taken from the Greek, and this must be translated in – transliterated into Latin; and there are one or two points in which it's often – very frequently incorrectly transliterated; for instance, in Greek, "*kappa*" should be transliterated "C," not "K"... but often it has been "K," as in the genus *Akera*, that should have been written with a "C," but while we have these rules for transliteration when a name has been transliterated wrong in a [...] allowed to stand. We don't admit [...], or at least most authorities don't admit emendations, and in fact no corrections are admitted in Zoology unless they are either obviously typographical or clerical errors. Any other – that is carried to rather an absurd extreme; for instance, in the case of the species named after the state of Pennsylvania, some of the authors who named them didn't study correctly; they used only one "n" instead of two; and then another author used an "i" instead of "y" in "*Sylvania*," but those errors are still perpetuated in our present zoology, although it seems that there would be very little against the idea of making all of the names uniform.

Now generic names usually express some quality of the animal described, for instance, the generic name *Rhinoceros*; but – and – but they do not necessarily have a zoological meaning. Some are named after an eminent zoologist, like *Lamarckia*, and others have a geographic connotation, while still other generic names are senseless or anagrams; for instance, in Möller, we have a name – we have two slugs – our common garden slug is *Limax*, but another genus of slugs was named *Milax*, a separate anagram of *Limax*. So, people use their imaginations and their humor in generic names more or less. Now to the – I should say that of course [...]

duplication of generic names occurs in the Animal Kingdom. Now it frequently happens that there has been duplication; for instance, a man working on a certain group in France and another in California might – working on different faunas, might very easily use the same name for different animals. Where this occurs, of course priority rules. The first one – the first author's name stands.

Now to come to specific names. A specific name is primarily an adjective, but it can also be a noun in apposition with the generic name, or it can be a personal name in the genitive form, or – and – or a geographic name, which is generally used in adjective form, like *floridanus* or *canadensis*. Now when a – when used in – when a species is named after some person, and used in the genitive case, it will – in the masculine gender it will be, for instance, you add -i to the entire name; [...] *jei*, or if it was named after a woman, it will be -ae; for instance, there is a whale barnacle which was named for Queen Victoria "*reginae*." And if you're naming it after several persons or several things, why, you use the genitive of the plural. For instance, there's another whale barnacle which is named *Coronula balaenorum*, the *Coronula* of whales.²

Now, as in the genera, no two species of one genus can bear the same name. When by accident they do, the later of the two names has to be changed. Now in the [...] name, when a species is described in one genus and is later transferred to another. Now let's see; there [...]; however, in writing specific names, we almost always append to the specific name the name of the authority who first named this species. That was not in the early times – Linnaean times – considered necessary. Now it's necessary for various things. One is because sometimes two authors have given the same name to different species, and in other cases; and always, having the authority after the specific name gives you a clue to where you have to look to find the original description, and sometimes it's a very valuable thing to have such a clue. If you have "Lam." for "Lamarck", after a description, you know you have to look in the works of Lamarck; and so the authority is a valuable part of the specific name, although it's not an absolutely necessary part.

Well now, when a species is being used in the same genus in which the author originally placed it, the authority is simply written without any punctuation, as I've written *Helix albolabris* on the board. But if *albolabris* has now been changed to a different genus... you recognize a great many genera in the dismemberment of the old genus *Helix* of a hundred years ago so if we make that *Triodopsis albolabris* then we indicate that the genus has been changed by placing parentheses around the name of the authority; so let me see, by *Triodopsis albolabris* (Say), you know that you have to look in the writings of Say to find the original description of that species, but also you will find it under some other generic name. This use of the parenthesis, while it is not universal, is very general at the present time.

Now I might also allude to two terms that are commonly used: "homonym" and "synonym." A homonym is the same word given to two different objects; and synonyms are different names given to one and the same object. Now we have many examples of both of these in zoological nomenclature, and most of them are cases which require correction.

Now another thing which is of great importance in modern nomenclatorial discussions is the matter of types. Now types –

² This is probably an error for *Coronula balaenaris* Darwin, 1841 (now *C. darwini*).

the type of a species is that specimen upon which – from which the original account of the species was drawn. That is plain enough; and the type of a genus – which is also called the “genotype” or – that word’s been used in another connection³, some people call it “generotype” – that is not so simple. Linnaeus and the early authors didn’t recognize any types of genera. The – it is – they simply gave a definition of the genus and let it go at that. Now of course we have to conclude that a species is simply objective; and a species is a real thing, established in nature and not a subjective idea of our own, and while it is sometimes difficult to tell species apart, and while you may be wrong in considering a certain difference to indicate a different species, that doesn’t alter the fact that a species is any interbreeding population of similar animals. And in considering that all animals [...] the process of evolution, it might be supposed that intermediate forms of these species would be as common as distinct species are, or even commoner; but that is not the case. [...] evolution apparently is not a continuous process but it’s a process of steps. Now if you take a certain species in the Lower Miocene of our southern states, why you can often trace that species up to the Middle Miocene and the Pliocene and then into the Recent. Now in each of those stages, the specimens will be different; you’ll see that they’re very closely related, but they’re different. They’re [...] markers; they’re steps, they do not intergrade. The intergrading stages must last a very short time, or else there are none; that is, evolution flows more or less by steps. That is forced upon anyone who studies this – the fossils of the later formations of our southern states, where we have a very nearly continuous series.

Well, now, in genera we have another entirely different state of affairs... I think this is a drastically – it’s a subjective conception. It has no necessary limits, and a genus at the time of Linnaeus covered very much more divergent forms than it does today. Genera have been constantly changing, as new – many new species have been added, the old subgenera subdivided, and also as new characters and the value of characters have been more justly estimated. For instance, Linnaeus had a genus which included all the air-breathing snails. If we accept the genus with his limits, why it would now have about ten thousand species, which would be... and quite...

All of the old genera have been subdivided time and again. Now when a genus is subdivided, which part of it retains the original generic name? This difficulty arose – first became acute in Lamarck’s time, half a century after the foundation of the Linnaean system, because then there was a very great increase of species and more appreciation of their differences, and the comprehensive genera of Linnaeus were being broken up. Now Lamarck issued, in 1799, a work on molluscan names; and in that he gives a definition of the genus, and he calls it by the name of a single species. He says: “selected a single species of each genus in order to make myself better understood.” That is among the earliest statements I have found of a type designation. The word “type” was used at first in the – in zoology, as far as I know, by a French author, Denys de Montfort, in 1810. Under each of his genera, Montfort said: “spe-

cies serving as type of the genus: so-and-so.”

Now as a great many genera have been described without designation of type and subsequent authors have often differed in the names to be applied to the different types of a group, the International Commission on Zoological Nomenclature has formulated rules for these decisions. A genus with one species of course takes that species as type; a genus with several species – if none of those species is – if one of the species has been designated by the author as type, of course that is taken as type. If one of the species – if the genus bears the same name as one of the species, why that species is considered type by tautonymy. For instance, Linnaeus did put the frog and toad in the same genus, *Rana*. He called the toad *Rana bufo*. Later, when the toads were considered to form a separate genus, the genus was named *Bufo*. Well, that automatically took *Rana bufo* as its type, by tautonymy. In other cases, [...] generotype is fixed by the first reviser of the genus. If some person revises an old composite genus and proposes to split off part of it for new genera, why he nominates a type for the old genus if it has not – doesn’t already have one; and once designated, that type cannot be changed by any subsequent author.

Now in the case of divisions of a species – now in recent years, species have been divided into subspecies, the same rules applying [...] for making species names, the restriction of them applies to subspecies. Some authors go even further in the division of species and subspecies and divide the subspecies into forma or varieties; but this has not yet been incorporated into the Code of Nomenclature.

Now I might mention the principal stages in the formation of the nomenclature which we use today. Of course, we have Linnaeus, who first formed a [...] set of rules, in 1751, in his *Philosophia Botanica*. The British Association for the Advancement of Science compiled a set of rules [...] at that time, in 1855, and in 1877 the American Association published, in their proceedings, rules for scientific nomenclature. These were compiled by W. H. Dall⁴, who was in – at the third Zoological Congress – International Zoological Congress, held at Leiden in 1895. A committee was appointed to draft rules of zoological nomenclature, and that – the first [...] was in 1901. It was not – the rules were not published in the English language and not available in America until 1926, and they were published in the Proceedings of the Biological Society of Washington. The commission on nomenclature appointed at the International Zoological Congress consists of fifteen members, these selected from the principal countries of Europe and America. For a long time, the secretary of the commission was Dr Stiles in Washington, who was a great expert on nomenclatorial matters. Now it is – now the headquarters of the Commission are in London. The international rules are closely followed by zoologists all over the world, but cases arise which are not fully explained in the – are not explicitly explained in the code of rules. The fact is, of course, that any code of laws requires interpretation by courts, and that is so in the case of nomenclature, which are especially involved. The International Commission, therefore, undertook to supply opinions on any questions which were in doubt

³Genotype indeed referred to something else by the time of this talk. It is, of course, the genetic makeup of a cell, organism, or individual, the full hereditary information, even if not expressed in the phenotype (observable characteristics).

⁴A long-standing question is here answered. Pilsbry, who knew Dall for more than 40 years, pronounces his name to rhyme with “pal”, not “hall.”

which were submitted to it. There are now about 150 Opinions,⁵ and while the rules – the code of rules, though they occupy many pages, why there are several hundred cases which need interpretations of the rules as applied to special cases. For instance [...] the case of generic names of different gender. Now in specific names, of course the name has to agree in gender with the genus, but in the generic name the gender is not subject to change, but the British zoologists generally consider names that differed only in gender as being homonymous – homonyms; for instance, *Conulina* and *Conulinus* they consider the same name, and a number of those cases related [...] the Commission gave an opinion in which it decided that names that differed only in gender were different words; so that both *Conulina* and *Conulinus*⁶ can be used for generic names. I think this will be a perfectly satisfactory decision because we have the same thing in common language; names like “Louis” and “Louise” are perfectly distinguishable and they were [...] different rules.

⁵ICZN Opinion 150 was published in 1943, so this talk likely dates from after that.

⁶ICZN Opinion 86 of 1925



(Above) A few of the 3,000+ scientific papers by Pilsby. Most concerned malacology and were published by the Academy of Natural Sciences, but many shorter papers were published in *The Nautilus*. Pilsby performed extensive, worldwide fieldwork and published on a wide variety of subjects.

(Below) The Academy of Natural Sciences of Philadelphia. Founded in 1812, this is the oldest natural science research institution and museum in the New World and presently contains more than 17 million biological specimens.



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John Allen Baker (1920-2011)

of Merritt Island, Florida, was a retired USAF Chief Master Sergeant with a love for people, music, and sea shells. Alan Gettleman wrote of John on Conch-L:

"John was one of the early members of COA, since at least 1973. There was no kinder or gentler person than he. He was always a gentleman, a kind and soft-spoken man who loved to laugh. John, true to his last name, was a great baker and his carrot cake was legendary. His parents were from Eleuthera, Bahamas, which is where he learned to love shells.

John was a past president of the Astronaut Trail Shell Club, and was a COA convention co-chair for the COA convention in Melbourne, Florida in 1990. He was always a vigorous supporter of COA, being our club's long time COA rep. I believe he was once a Trustee of the COA. At the St. Louis COA convention, when our St. Louis members wanted to hear the presentations, John offered to man the reception booth to allow them to attend. Homer Rhode of Englewood tells the story that he and John were roommates at a COA and both were bidding on the same land shell at the COA oral auction. After several raises of the bid John yelled across the room to Homer: "Homer, stop bidding, I'm buying the shell for you!" That story expresses well his generosity.

John was not active in shelling over the past decade and was in declining health. John Baker has the wonderful legacy that there are only good things to say of him and you were happy whenever you saw him. God bless you, John, and good shelling."



Carol Belle Stein (1937-2010)

of Johnstown, Ohio, was well-known to collectors and others interested in freshwater snails. Carol received her MS and PhD degrees from Ohio State University where she remained as curator of the OSU Museum of Zoology for 31 years. Her passion for freshwater snails and her years of research translated into a wealth of knowledge and expertise about these little known and often ignored mollusks. Carol was an early advocate for computerized record keeping of museum collections and her electronic database for the Ohio State University collection was one of the first in the country. She was a strong and effective advocate for river and stream conservation, leading the way for the Scenic Rivers Program of both Ohio and the rest of the country. Dr. G. Thomas Watters stated on Conch-L, "Carol, along with her advisor Dr. David Stansbery, nearly single-handedly formed the Division of Mollusks at the Ohio State University." What Carol Stein began so many years ago is today a world-class repository of specimens and knowledge of freshwater mollusks.

When she retired from academia, Carol devoted much of her time to raising, training, showing, and adopting out dogs. She worked with show dogs, therapy dogs, and mutts that needed

homes. Carol helped educate many people on the proper care and training of dogs through her personal contacts and many talks to local clubs such as the 4H Clubs. This sparkling and upbeat lady with her positive attitude will be missed.

Katherine "Bobbi" Cordy (1938-2011)

was probably known to just about every member of COA. Certainly those who attended annual conferences, or any of several Florida shell shows through the years, or had any dealings with the Board of Directors, got to know her well. In fact it was Bobbi, some 30 years ago, who sparked, pushed, cajoled, and served as the key organizer behind the annual Astronaut Trail Shell Club's shell show. The last few years Bobbi served as COA Secretary, a job few would want as the benefits are nil and the responsibilities rather high. Bobbi accepted this with typical aplomb and did a great job. She and husband Jim have shelled in Guaymas and San Carlos, Mexico; numerous places off southern California; many of the Bahaman Islands; Hawaii; and the Philippines. They are, however, perhaps best known for their collecting trips to the Bahamas. Although these trips included such destinations such as Bimini and Abaco, their favorite shell collecting spot by far was Eleuthera, the "Island of Freedom." Again and again they returned to this small jewel in the Bahamas to experience the beauty of Eleuthera and to introduce others to this wondrous place.

Most recently Bobbi and Jim worked with the Brevard Museum of Natural History to create the Johnson-Cordy Hall of Mollusks, featuring a revitalized Johnny Johnson collection as well as shells donated by the Cordy's (see American Conchologist, vol 38, no. 2, June 2010). Also in this newly established display are many specimen shell constructs of living specimens sculpted by Bobbi. Bobbi molds and paints a living mollusk out of clay that when combined with an empty shell serves as a near perfect model of the living animal.

Bobbi often joked that she left the science part of conchology (the scientific nomenclature) to her husband Jim, while she enjoyed the beautiful shells and the wonderful people she met through her hobby. Alan Gettleman said recently, "Bobbi was a truly larger than life person, a passionate advocate for the hobby and science of shelling and a person of extraordinary energy." The Caribbean marginellid *Volvarina cordyorum* Cossignani, 2009 was named for Jim and Bobbi Cordy. Bobbi's energy, work ethic, good humor, and friendliness will be sorely missed by the shell collecting world.



Emmanuel Guillot de Suduiraut (1938 - 2010)

"Manou," as he liked to be called, was born in Monségur, in the Gironde, France, in a noble family with close ties to the early French monarchy. His ancestors produced the famous Suduiraut wines, generally known as the second best Sauterne wine, of which Manou was happy to offer me a prestigious bottle on several memorable occasions. Manou was proud of his ancestry and definitely inherited many of their qualities. This is reflected in the names of shells he described, such as *Vexillum sauterneSense*, after the Sauterne wines, and *Vexillum lavoisieri*, named after the French nobleman Antoine-Laurent de Lavoisier, father of modern chemistry, who lost his head in the French revolution.

Following family tradition, Manou's first career was in southern France as a wine-dealer. Later he joined the army and was stationed in the French Congo. This seemed to trigger a love for voyages. After his stint in the army, he traveled several months a year, and driven by a relentless curiosity, visited many countries. His adventuresome spirit saw him traveling through areas few westerners could or would travel to at that time, such as Afghanistan and Yemen. When approaching his 40s, he went to Palawan, Philippines, and fell completely in love with the place. The blue and turquoise waters with white beaches, palm trees, and beautiful people, were a strong contrast to winters in Europe.

With his typical logic and perseverance, Manou sold everything: house, car, etc., and stepped into a changed life. He rented a small island in Palawan and constructed a "beach resort." He bought a banka [traditional Philippine outrigger boat] and started living life on a small remote island in the very remote Palawan. Every afternoon he snorkeled for hours, discovering the amazing marine life in the area. It is at that time he met Evelyne, who he married, caring greatly for her and her daughter Jacky for the rest of his life. It is also during these early years that he traveled throughout the Philippines, south to the now inaccessible Sulu Sea islands, such as Jolo. He is one of the only westerners who dived and personally collected *Cymbiola palawanica* Douté, H. & P. Bail, 1999, and collected many of the fantastic orange *Conus bandanus vidua* Reeve, 1843, forma mozooi.

Life on a small island in the tropics is pretty hard, but Manou enjoyed it until his resources ran out. When things went bankrupt, he took his banka and left. He often told of the hardships of crossing the Sulu Sea in his banka in stormy weather with only Evelyne and the small Jacky on board. Anybody who knows the dangerous Philippine waters will appreciate the guts of such an exploit. The family finally arrived in Cebu. He had about 100 pesos (about \$5 at that time) in his pocket, but he also had a hidden treasure he developed while in Palawan - a deep love for marine life and a passion for seashells. This was in the early 1980s and he soon set up a small business supplying Philippine seashells to Atlantic Seashells in Portugal.

His fine French education helped Manou a lot and he gained a reputation for quality and expertise. His client base expanded and he was soon supplying us at Poppe Shells in Belgium. It was with true delight that we opened treasure box after treasure box of Manou supplied shells. They are now dispersed in many collections all over the world, with many superb specimens in the Poppe-collection in the Koninklijk Belgisch Instituut voor Natuurwetenschappen (KBIN), Brussels [Royal Belgian Institute of Natural Sciences]. Manou went beyond the classic "buy and sell" mode and started exploring the waters of Balicasag Island with great enthusiasm. Balicasag became what it is today thanks largely to Emmanuel Guillot de Suduiraut.

Manou built a small house on Balicasag and every morning at 6 a.m., when the fishermen finished lifting the tangle nets, he would make his choice of the catch with an expert eye. Each shell he acquired was fully recorded and the records fill several books. He did this for many years, three days a week on Balicasag Island. It is difficult to explain how hard such a task is, the weekly

travel from Mactan to Balicasag takes almost one day: one hour to the harbor of Cebu, two to four hours on the sea, back one hour by tricycle all over Panglao, and finally half an hour in a very small banka in the big waves from Panglao to Balicasag Island.

Manou had the very healthy mentality that money is a "means," so he invested much of his revenue in tangle netting, which is a rather expensive enterprise. His daily efforts brought to light much of the treasures that were the delight of the period I call the "diamond time" of shell collecting: the early eighties until the economic crisis hit the world in 2008. He was the first to put nets as deep as 360m, bringing up treasures such as the wonderful red *Perotrochus vidiani* (Kosuge, 1980) from the Balicasag-Pamilacan area.

Shortly before I moved to the Philippines, Manou started selling shells directly online and he discovered the life of a shell dealer. He was delighted with the discoveries and thrilled when transactions went well, but he was furious with the classic hassles such an activity brings. He ended his Balicasag enterprise about four years ago and Conchology, Inc., took over his last fisherman. By the end of his activities Manou had more than 5km of tangle nets in the area! This is down to a few hundred meters today and without Manou and his almost daily influx of cash, Balicasag has become a desert for shells and the local population are more oriented to the hundreds of tourists who visit daily.

During all the years Manou avidly collected Mitridae and Costellariidae, he contributed considerably to the popularization of these families. He maintained a broad network with many experts whom he generously supplied with study material. When he found a shell he thought might be new to science and that appealed to his notions of aesthetics, he tried to find an expert. Manou described a number of species, often in collaboration with other mitrid or costellarid-lovers. There have also been many shells named after Manou (this list is not complete).

- Falsilatirus suduirauti* Bozzetti, 1995
- Trivellona suduirauti* (Lorenz, 1996)
- Calliostoma suduirauti* Bozzetti, 1996
- Clavus suduirauti* Bozzetti, 1997
- Lyria suduirauti* (Bozzetti, 1997)
- Colubraria suduirauti* Parth, 1999
- Nipponaphera suduirauti* (Verhecken, 1999)
- Calliostoma emmanueli* Vilvens, 2000
- Fusolatirus suduirauti* (Fraussen, 2003)
- Coralliphila suduirauti* Smriglio & Mariottini, 2003
- Chattina suduirauti* (Lamprell, 2003)
- Conus suduirauti* Raybaudi Massilia, 2004



Clathroterebra suduirauti (Terryn & Conde, 2004)
Chilodonta suduirauti Poppe, Tagaro & Dekker, 2006
Acrosterigma suduirauti Vidal & ter Poorten, 2007
Mitrella suduirauti K. & D. Monsecour, 2009
Vexillum vicmanoui H. Turner & M. P. Marrow, 2001 (named after Victor Pagobo (nickname "Vic") and Emmanuel, nickname ("Manou"))
Calliostoma jackylenae Bozzetti, 1997 (named after his daughter Jackelyn)

Some of the mollusks named by Manou include:

Vexillum sauternesense Suduiraut, 1997
Vexillum alvinobalani Suduiraut, 1999
Mitra poppei Suduiraut, 2000
Scabricola condei Suduiraut, 2001
Scabricola lavoisieri Suduiraut, 2002
Domiporta dianneae Salisbury & Suduiraut, 2003
Mitra heinickei Salisbury & Suduiraut, 2003
Mitra schepmani Salisbury & Suduiraut, 2003
Neocancilla splendidula (Salisbury & Suduiraut, 2003)
Neocancilla rikae Suduiraut, 2004
Vexillum monalizae Poppe, Suduiraut & Tagaro, 2006
Vexillum balicasagensis Salisbury & Suduiraut, 2006
Vexillum darwini Salisbury & Suduiraut, 2006
Vexillum dautzenbergi Poppe, Suduiraut & Tagaro, 2006
Vexillum gouldi Salisbury & Suduiraut, 2006
Vexillum luigiraybaudii Poppe, Suduiraut & Tagaro, 2006
Vexillum monsecourorum Poppe, Suduiraut & Tagaro, 2006
Vexillum thorssoni Poppe, Suduiraut & Tagaro, 2006
Visaya rosenbergi Poppe, Suduiraut & Tagaro, 2006
Vexillum epigonus Salisbury & Suduiraut, 2006
Vexillum jackylenae Salisbury & Suduiraut, 2006
Vexillum evelynae Suduiraut, 2007
Vexillum poppei Suduiraut, 2007
Vexillum tanguyae Suduiraut & Boutet, 2007
Vexillum hoaraui Suduiraut, 2007

I knew Manou only for a little more than the last two decades of his life, but it must be said he was a "character" I enjoyed. We spent quite a lot of time together at various shell shows, at my house in Brussels where he stayed during his yearly visits before going to Saint Jean de Luz in southern France, and on Balicasag Island and at his place in Mactan, Punta Engano, where he lived in "native style." Manou was passionate about everything and it is with admiration that I remember him discussing philosophical matters with my friends until 5 a.m. in the morning amidst cigarette smoke and fueled by delicious wines. He read a lot, especially philosophy and natural history. He had a deep admiration for Charles Darwin - thus his *Vexillum darwini*.

With the passing of Manou, a chapter in the conchological world has closed. In the short time we shared, I got enough material to write a book on this fascinating character. He was one of the true "Adventurers" and his passing away leaves an empty place in the hearts of the ones who knew him and loved him.

Guido T. Poppe
<http://www.conchology.be/>
<http://www.poppe-images.com/>

Trevor D. Roberts (1913-2011)

of Central Whidbey Island, Washington, was a consummate shell collector, traveler, fisherman, and without doubt one of the nicest people you could ever meet. Trevor had an extensive shell collection and had pretty much turned his island home into an attractive shell museum. Specially made shell cabinets and spacious shelving set off his shell collection to great advantage.



Trevor, wife Heriette (met while both were skiing on Mt. Rainer), and two sons Sandy and Ron, moved from Seattle to Whidbey Island in 1952. Trevor 'worked' as a salmon fisherman (a beloved passtime) and truly believed a bad day fishing was better than a good day not fishing. He and Heriette saved enough money to purchase the Whido-Isle Beach Resort, a 10-cottage seaside resort on Central Whidbey. He knew they would never get rich running a resort, but despite the hard work and sometimes long hours, it gave him many opportunities for fishing, a childhood passion. They eventually subdivided the land, selling off most of the resort as individual lots in a subdivision they named "Shangri-La Shores." The profits provided funds for travel and they did quite a bit over the next few years. This travel sparked Trevor's interest in shells and after his wife's death in 1977 he continued to travel and collect shells. When the community of "Shangri-La Shores" had a new pier constructed in 2009, they named it the Trevor D. Roberts Pier.

Trevor literally traveled the world in search of shells. A wall map in his home had the countless pins representing each stop, a stop where Trevor smiled his ever-present smile, wandered the local markets, snorkeled in the shallows, and walked the beach, talking to and making friends with the locals. There are pins all around Australia, throughout the Pacific, Indonesia, the Philippines, South America, Sri Lanka, Europe, etc. Each stop was a shelling opportunity and a chance to meet and make new friends. Trevor liked people and he liked making friends. He was incredibly easy to talk to and always seemed genuinely interested in other people and their stories. He has been a member of the Pacific Northwest Shell Club for over two decades and any member will tell you, it is a true pleasure to have known this warm and friendly man.





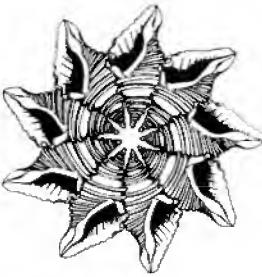
Vol. 39, No. 2, June 2011

thomas@nerite.com www.conchologista.org

CONCHOLOGIST

A Worldwide Journal of the Conchology of America

CONCHOLOGISTS OF AMERICA, INC.



In 1972, a group of shell collectors saw the need for a national organization devoted to the interests of shell collectors; to the beauty of shells, to their scientific aspects, and to the collecting and preservation of mollusks. This was the start of COA. Our membership includes novices, advanced collectors, scientists, and shell dealers from around the world. In 1995, COA adopted a conservation resolution: Whereas there are an estimated 100,000 species of living mollusks, many of great economic, ecological, and cultural importance to humans and whereas habitat destruction and commercial fisheries have had serious effects on mollusk populations worldwide, and whereas modern conchology continues the tradition of amateur naturalists exploring and documenting the natural world, be it resolved that the Conchologists of America endorses responsible scientific collecting as a means of monitoring the status of mollusk species and populations and promoting informed decision making in regulatory processes intended to safeguard mollusks and their habitats.

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Front Cover: *Placostylus strangei* (Pfeiffer, 1855) a rather handsome tree snail in the family Bulimulidae on a tree in the Solomon Islands. For more about these islands and the land snails and other wildlife that abound there, see Simon Aiken's article on page 4.

Back Cover: *The Shell Collectors*, acrylic on canvas, 36" x 60," painted by COA member David Herman of East Meadow, New York. Regretfully, it had to be cropped a bit to fit the back cover, but I think it still conveys a sense of the expanse of a seashore.

Editor's Comments: This is the first 40-page issue of *American Conchologist*; thanks to Johnson Press of America, Inc., of Pontiac, IL, and to the many folks who submitted articles. My thanks to all who submitted articles and apologies to those who I had to bump back to the next issue. Hang in there, I will get to everybody.

After the last issue, I received a couple of interesting letters from Tom Rice. Some of what he had to say is summarized below and some resulted in the article on page 27, "What is a shell worth," by Tom. One of the expensive shells he mentions is a rare cowrie, *Austrasiatica alexhuberti* (Lorenz & Hubert, 2000). The other shell he mentions is a sinistral *Turbinella pyrum* (Linnaeus, 1758). The *Turbinella* or sacred chank, is discussed in Tom's article and in a great follow-on article by Harry Lee, one of the very few people who actually owns a sinistral sacred chank (page 28). For those who may wonder what one of the most expensive shells in the world looks like, you can see a left-handed *Turbinella pyrum* on page 28 and the *Austrasiatica alexhuberti* below, courtesy of Felix Lorenz, who has probably handled more of these than anyone else in the world.



Dear Tom,

Just received the March *American Conchologist* and have enjoyed all the articles. Especially George Metz's on parasitic mollusks. I would like to draw attention to another group, referred to as kleptoparasitic mollusks in the family Trichotropidae. Erika Lyengar has studied these and we have an article and video on our web site concerning them: www.ofsealandshore.com/news/kleptopaper/kleptopaper.php

Re: "Conch shells on coins" by Jesse Todd in *American Conchologist* 39(1). A previous article might be of interest to Amer. Conch. readers, "Mollusks on Coins" by Wolfgang Fischer. Originally it appeared in *Club Conchylia Informationen* 31(1-2) 1999, and was reprinted in *Of Sea and Shore* 23(1): 37-42 (2000). That issue of OS&S (as well as Vol. 1 #1 through Vol. 23 #3) can be accessed on our web site (better, clearer images of all issues Vol. 1 #1 through Vol. 27 #4 available on DVD as well - info on web site).

Tom Rice -- Rawai Beach, Phuket, Thailand

In the thick of it: The jungles of the Solomon Islands

Simon Aiken

"But we have nobody to cook!" exclaimed the owner of the town's only restaurant, excusing why they were closed at dinner time. No doubt this delicious ambiguity was unintentional, in a country notorious for cannibalism well into the 20th Century, but it shows what the modern traveler in the Solomon Islands must expect. And I was in the third largest town in the country.

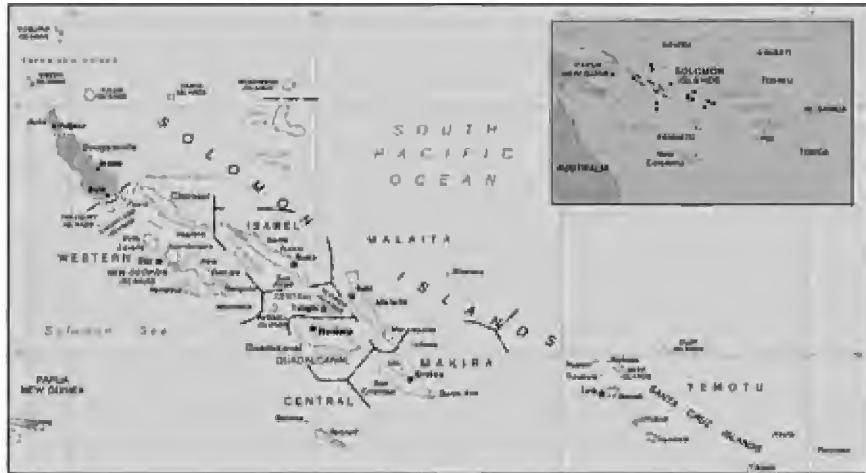
In a previous *American Conchologist* (March 2011, vol. 39, no. 1) I wrote of my quest for seashells in the Solomon Islands, a huge archipelago almost untouched by tourism. Flying over the larger islands reveals steep mountains covered in dense jungle with no roads and almost no inland settlements. Except in a few areas, there has been little deforestation, so 90% of the country is rainforest. It is challenging terrain, to be sure, but very promising for the landsnail collector. A good machete is essential; a relaxed attitude to hygiene is helpful. Swampy areas in the jungle are popular with leeches; innocuous looking plants such as the *nalato* and *hailasi* will cause serious blisters if touched. The jungle is divided by fast-flowing streams and rivers, and trails are prone to flashfloods. The 'roads' (apart from in Honiara) are still made from dead coral – they were constructed by US Navy Seabees in the 1940s and there has been no reason to upgrade them.

The Marau area of Guadalcanal holds the dubious title of the second wettest place on earth. A year's rainfall here can be 500 inches – ten times the annual drenching of Florida. The soil is rich and volcanic, with some limestone areas. Promising habitats for snails, certainly, and one must wonder how many exotic species await discovery in these almost impenetrable rainforests. I could say that my most successful landsnail collecting was in the rain, but it was almost always raining!

The range of molluscan fauna in the Solomons bears similarities to New Guinea and the Bougainville Islands, but there is a high proportion of endemic species. The colorful *Papuina* and *Megalacron* are varied and conspicuous and many are endemic to just one island. The migration of species has generally been eastwards – from Malaysia, through New Guinea, and then down through the Solomons.

There are relatively few mammals in these islands. There are several species of rat, but the larger tree-climbing ones (bigger than domestic cats!) are endangered or extinct. The main predators of snails are presumably birds, and the Solomons certainly has a rich ornithological fauna. The 3-foot-long Blyth's hornbill (*Aceros plicatus* Forst, 1781) is common in the forest canopy, especially in New Georgia province. This noisy omnivorous bird is the most easterly of the world's hornbills.

Most Solomon Islanders live in small villages on the coast. The rainforest is so dense that travel between villages is by dug-out canoe. The median size of a settlement is just 41 people



and perhaps it is this emphasis on small close-knit communities that has helped preserve many traditional aspects of their life. Society is matrilineal, with land inherited through the female line, a tradition stemming from head-hunting days when so many young men died violent deaths. There is no electricity outside of a handful of towns, and no running water. Houses are still built of raw materials from the jungle. A few years ago there was a little migration from coastal villages to inland sites in response to

Printed Red

A century ago, the author Jack London warned of the dangers:

"The Solomons ought to be printed red on the charts – and yellow, too, for the diseases." (Adventure, 1911)

Head-hunting and cannibalism were real dangers then, particularly in New Georgia – but, thankfully, not any more. Tropical diseases certainly remain a concern for the modern traveler though. The Solomons is one of the worst countries in the world for malaria, with drug-resistant strains abounding. Even with hospital treatment, malaria is often fatal here. For any visitor, preventative treatment with atovaquone and proguanil is strongly recommended. Typhoid, hepatitis A, and dengue fever are also widespread.



the devastating 2007 tsunami. So sometimes the traveler comes across a ‘clearing’ in the jungle with a couple of hastily erected shelters and a small area of crops. Mostly though, the Solomons has a distinctly ‘time-warp’ feel about it.

The Solomons had its place on the world stage in the 1940s. The Japanese built an airfield on the coast of Guadalcanal which would threaten Allied territories as far away as Australia. American landings on Guadalcanal eventually pushed the Japanese off the island (December 1942), but at terrible cost to both sides. That airfield – renamed Henderson Field – is still the only international airport in the Solomons. It is not much to look at, as airports go, without so much as a vending machine. Historically though it is one of the world’s most significant airports, because the Japanese never recovered from that defeat. Admiral Raizō Tanaka of the Imperial Japanese Navy stated: “On that insignificant shore, inhabited only by islanders, Japan’s doom was sealed.” (*Japan’s Losing Struggle for Guadalcanal*, R. Tanaka with R. Pineau, Part II, “USNI Proceedings,” August 1956).

In 1943, the Japanese remained entrenched in New Georgia, where they had built an airbase at Munda. To supply their Munda troops, Japanese warships used ‘The Slot’ – the strip of deep water that divides the Solomons into two parallel island chains. We now call it the New Georgia Basin. It’s a significant geographic feature because it separates the quite different molluscan faunas on each ‘side’ of the Solomon Islands. In the jungles of Munda it was sobering to think that I was collecting snails on the site of some of the most brutal and messiest close-quarter fighting of WWII. It was surreal to cut through the thickest jungle and then suddenly encounter barbed wire – 1940s barbed wire, of course. Any traveler here should certainly see the Peter Joseph WWII Museum, which houses a remarkable collection of artifacts from both sides of the conflict. Exploring in this jungle will certainly turn up war-related items, even now. At the museum I saw bags of human bones, recently collected and awaiting repatriation.

In this article I illustrate some of these islands’ most beautiful snails, many of which I was fortunate enough to photograph in their natural habitats. For a scientific treatise on Solomons landsnails, the reader should seek the books of André Delsaerdt. Volume 1 of “Land Snails on the Solomon Islands” (L’Informatore Piceno, Ancona, 2010) covers the *Placostylus* and volume 2 (Camaenidae) is expected at the end of this year.

Kastom and tabu

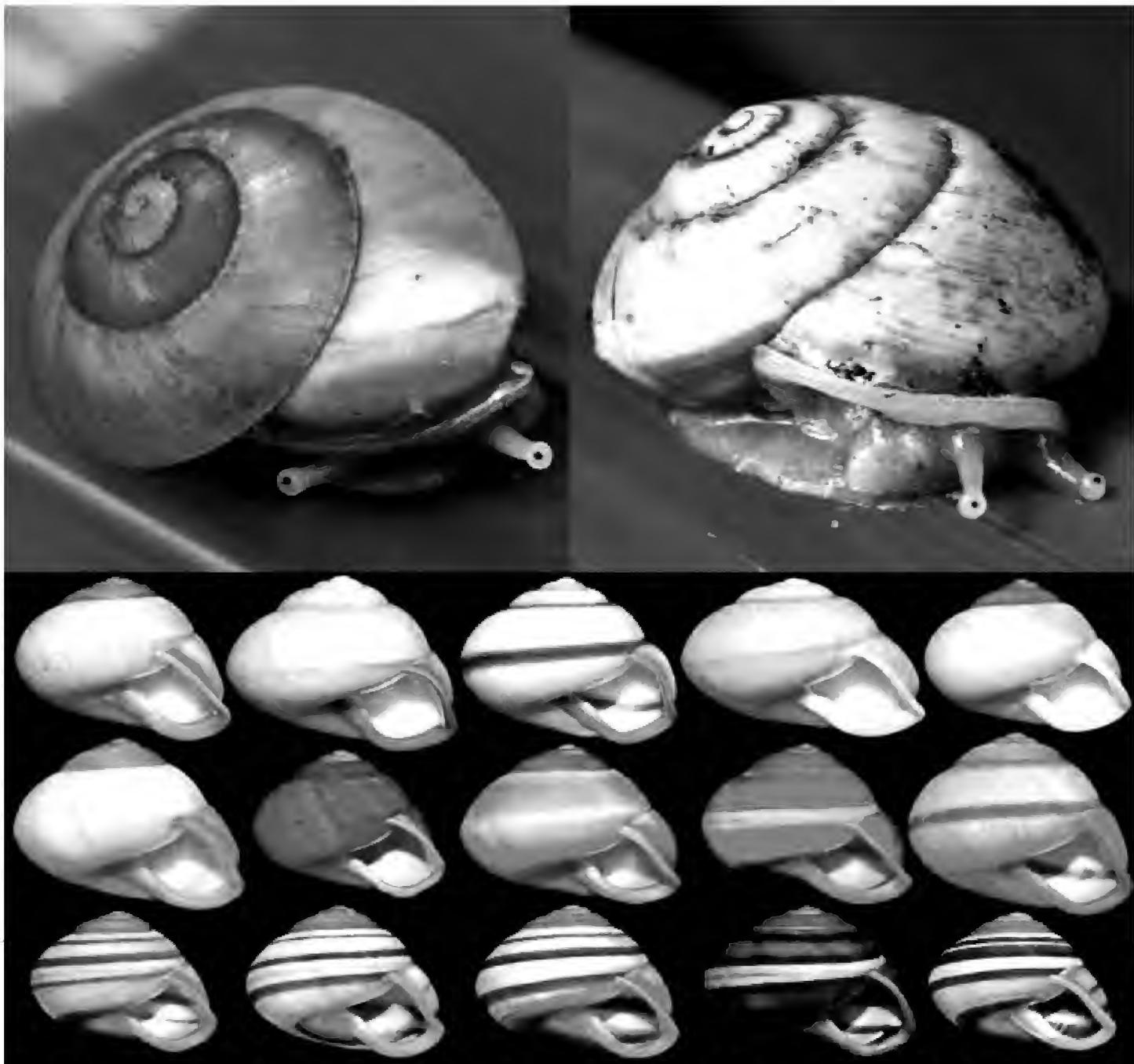
Few societies are as rich in tradition and beliefs as the Solomons. The visitor frequently hears the word ‘*kastom*’ (custom), which can refer not just to tradition but to special sites and lands and also to the levy that must be paid to visit these *kastom* sites. The shell collector must be aware that almost all land, including beaches and reefs, is privately owned and the owner very likely expects a ‘*kastom* fee’ for just walking there. Often permission is granted after a gift of fruit or betel nuts. Similarly, the visitor must be aware that life here is governed by many *tabus* and the penalties for breaches are severe. It is typically tabu for women to visit skull shrines and in some villages menstruating women are confined to a special hut that is strictly tabu for the men and children.



(Above) *Crystallopsis hunteri* (Cox, 1872) is one of the many exotic representatives of family Camaenidae in the Solomons. This specimen was in dense foliage near the village of Suhu, in the Marau district of southern Guadalcanal. The shell is transparent and fragile, so perfect specimens are rare. Sub-adults appear green, because of coloration of the animal.

(Below) “*Oe! Oe!*” In the ‘Are’Are language of the Marau people, a snail is ‘*oe*.’ A conspicuous Marau snail is *Megalacleron sellersi* (Cox, 1872). The upper-right specimen is the typical form (18.2mm) and below it is a variation (18.9mm).

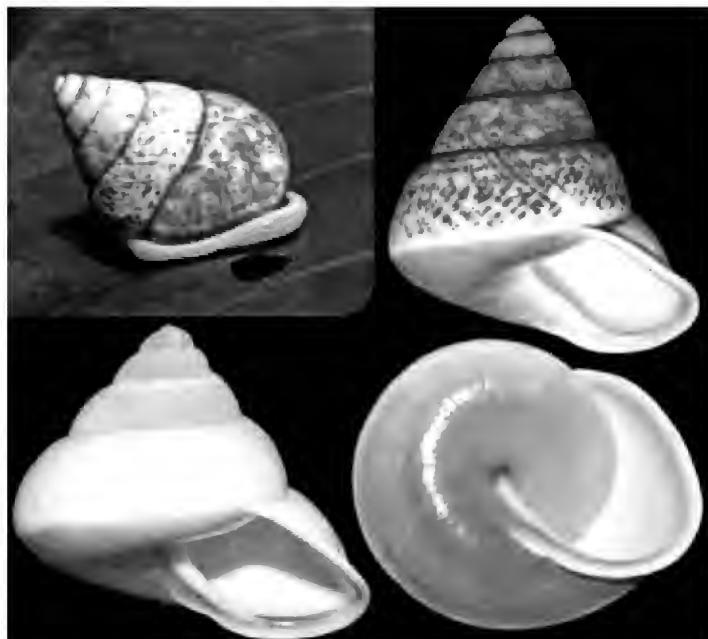




(Above) Most references describe this species as *Papuina vexillaris*, but the true name is *P. fringilla* (Pfeiffer, 1855) – a long-standing confusion that has been perpetuated by shell dealers. Two contrasting forms are well known, shown here with the live animals in the jungle several miles from Munda, New Georgia. The best-known form has a prominent purple/rose lip and a similarly colored apex. Alternatively, the whole shell is cream with a white lip, often with a less-rounded body whorl. I was, however, able to find other important variations. Some purple-lipped specimens do indeed have a white apex (top row, second specimen), and I found two specimens with a purple apex but white lip (top row, fifth specimen). Multi-banded forms (bottom row) or shells with brown or pink body whorls are also rare. The variations shown here range from 19mm to 25mm.

“The War Is Over!”

The Solomons...this is the country where it took until 1965 to convince Japanese soldiers that WWII was over. There were reports of aged Japanese soldiers ‘holding out’ in the jungle as late as 1989. Such are the difficulties with linguistics, transport, and impenetrable jungle that communicating across this island nation has always been problematic. Nowadays, phones are rare outside Honiara; internet access is difficult in Honiara and impossible elsewhere; there are only a handful of post offices spread across half-a-million square miles of Oceania; and there are 63 official languages. It is perhaps because of the communication problems that traditional village life survives in the Solomons.



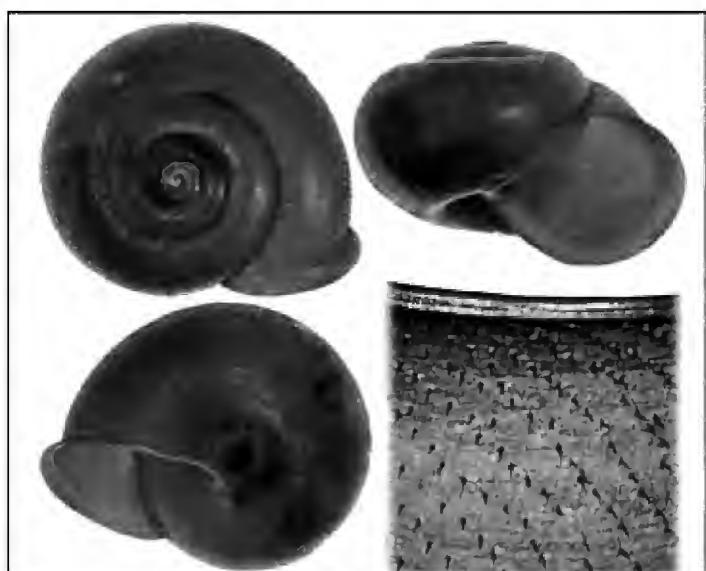
(Above) This is the 'real' *Papuina vexillaris* (Pfeiffer, 1855), also from Munda (24–25mm). Although the shells familiar to collectors are pure white, in life the shell is covered in a layer of algae – which presumably aids camouflage. Very careful cleaning can preserve much of this green algae (top right).



(Above) These are three of the rarer *Papuina* I collected in New Georgia: (1) *Papuina lienardiana* Cross, 1864, 18.5mm; (2) *P. eros* Angas, 1867, 18.5mm; (3) *P. eddystonensis* (Reeve, 1854), 19.9mm. Each is remarkably similar in shape.

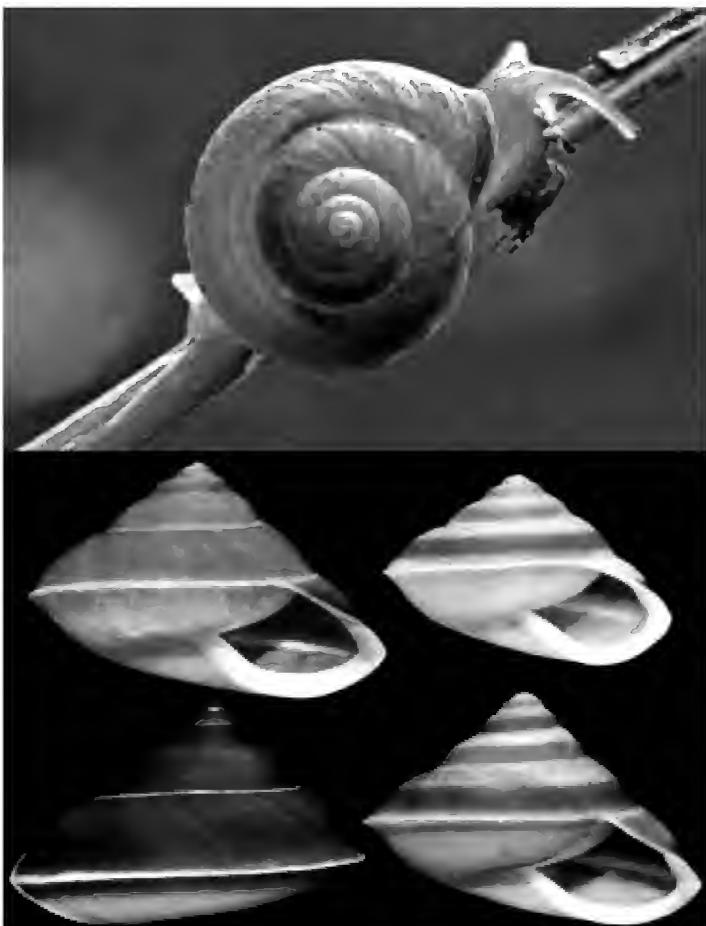


(Above) A highlight of the trip was finding this *Papuina* in dense jungle a few miles from Munda. It appears to be an undescribed species. Unfortunately I found only two adult specimens, but the species will be described this year by André Delsaerdt. The specimen shown here (24.4mm) will be a paratype. Finding a new land species just a few miles inland makes one wonder how many new species await discovery in these islands.



(Above) *Chloritis eustoma* Pfeiffer, 1842 (18.7mm) has a flaky brown periostracum, covered in tiny hairs. The few live specimens I found in Guadalcanal and New Georgia proved difficult to clean without damaging the periostracum.

(Below) In the Roviana language of Munda, a snail is 'suloco.' The most conspicuous *suloco* to the townspeople of Munda is *Dendrotrochus helicinoides cleryi* (Récluz, 1851), which lives on trees and bushes in the town itself. The specimens here (13.7–19.2mm) show the range of colors, patterns, and size. In Guadalcanal, I collected the relatively unpatterned nominate form.





(Above) This 'semi-slug' in the jungles of New Georgia belongs in family Helicarionidae. The coiled internal shell is clearly visible. The damage to the leaves is largely due to grasshoppers, not to mollusks!



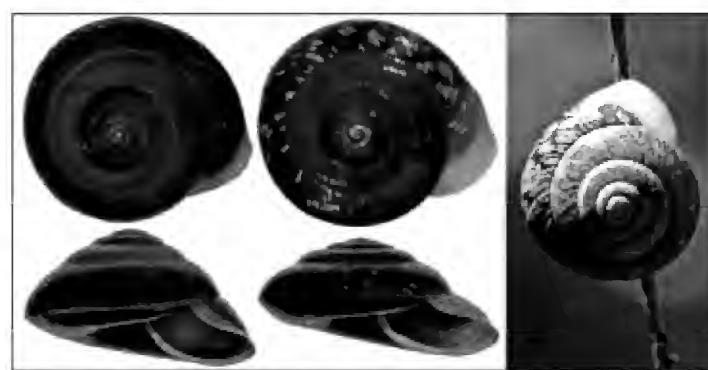
(Above) The typical view of *Placostylus strangei* (Pfeiffer, 1855) for the collector is "looking up at it" (see front cover). These are from New Georgia: (1) normal adult (50.5mm) with a rich brown periostracum; (2) specimen with a deformed lip (43.7mm). The Solomons is home to 39 described species and subspecies of *Placostylus*, all endemic and many confined to just one island. In 1893, Charles Hedley postulated *Placostylus* distribution as evidence of a former 'Melanesian Continent' – a theory long-since disproved by geological studies. The dispersal of the *Placostylus* species is still poorly understood and seems to be from south-east to north-west, opposite the direction taken by other flora and fauna in the Solomons.



(Above) A colorful grasshopper nymph poses obligingly in New Georgia. The Solomons are a paradise for students of entomology and have so far been rather poorly documented.



(Above) These *Partula* from two different provinces show consistent differences in shape, but are considered the same species: *P. flexuosa* Hartman, 1885. (1) Guadalcanal specimen, 14.6mm; (2) New Georgia specimen, 15.3mm. The live animal was photographed in Marau. Both Pilsbry and Crampton used the distribution of *Partula* species across the Pacific islands as evidence of a former Late Paleozoic or Early Mesozoic continent in the middle of what is now the Pacific Ocean.



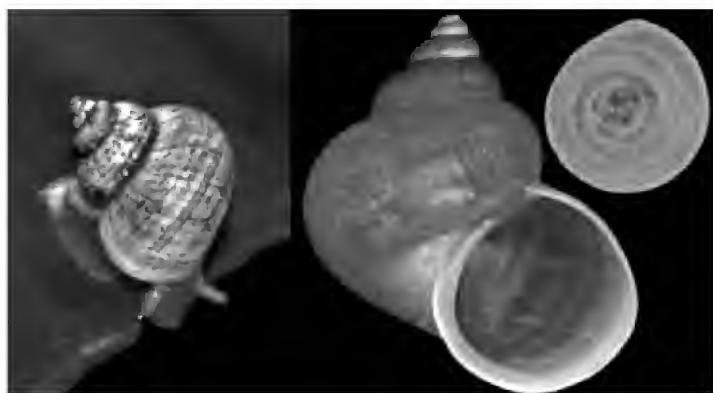
(Above) Beautiful trochomorphids are found in the Solomons. *Trochomorpha deiopeia* (Angas, 1869) (left images, 19.1mm) is easily confused with the much better known *Trochomorpha meleagris* Pfeiffer, 1855 (center images, 20.3mm, and live animal). The spire elevation is the surest way to distinguish these two species which coexist in New Georgia.



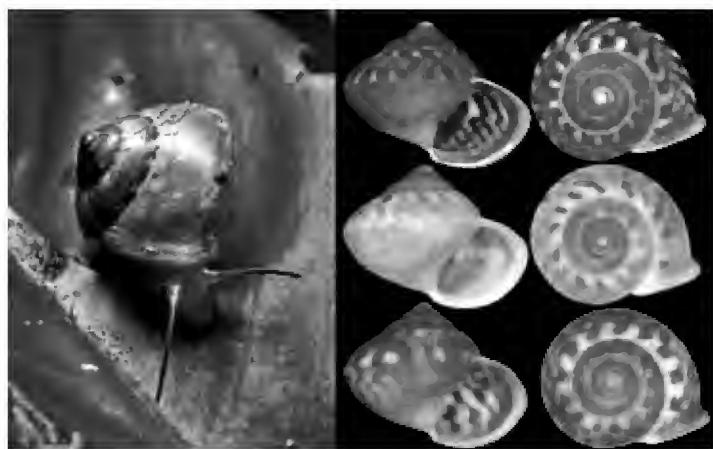
(Above) *Trochomorpha xiphias rubianaensis* Clapp, 1923 is one of the most beautiful of its genus. These shells (17.7–18.9mm) were collected around the town of Munda.



This widespread but inconspicuous snail is *Omphalotropis nebulosa* (Pease, 1872), in the prosobranch family Assimineidae. I collected specimens on bushes in Munda town. At 9.1mm, this specimen is a veritable giant!



(Above) The operculate family Cyclophoridae is well represented in the Solomons. This easily overlooked species is one of the smallest: *Pseudocyclotus levius* (Pfeiffer, 1855). The cleaned shell is only 7.3mm and was collected in the jungles of New Georgia.



(Above) The widely distributed *Palaeohelicina moquiniana* (Récluz, 1851) is found in three distinct color forms in the Solomons. These specimens (8.6–8.9mm) are from the Munda area in New Georgia.



(Above) “If you go down to the woods today,” even after 68 years have passed, you may well come across one of these. This particular ‘specimen’ was found in thick jungle while hunting *Papuina*. Controlled detonations of WWII bombs are an almost weekly occurrence around Munda. Coke bottles from the 1940s are still strewn throughout the jungle and relics such as ‘dog tags’ are often found.



(Above) *Palaeohelicina spinifera* (Pfeiffer, 1855) is a much more secretive species, inhabiting dark and damp corners in the jungle. There are several contrasting color forms. The three specimens here (13.6–15.0mm) were collected in Marau; the live animal is slightly sub-adult.



(Above) The author examines *Leptopoma woodfordi* Sowerby, 1889 on a leaf in the jungle of Marau. At right: (1) *L. woodfordi*, 16.9mm; (2) *L. dohrni* (Adams & Angas, 1864), 16.4mm, also from Marau; and (3) *L. perlucida* (Grateloup, 1840), 13.4mm, from New Georgia. The animal of *L. perlucida* is a striking yellow color.



(Above) In Suhu village, Marau, a boy shins up a coconut palm, an essential skill for Solomon Islanders. Coconuts are grown in most coastal regions. There are, however, very few 'plantations,' except on the plains region of northern Guadalcanal. The coconut palm is integral to the islanders' way of life. The 'milk' is a readily available and cooling drink. As well as eating the flesh, it is dried into 'copra' in each village, which is the principal cash crop. The fronds become building materials and the 'coir' (husk fiber) is made into rope.



(Above-left) A typical Marau house in Vutu village. Traditional building materials and methods are still the standard. The tropical rain is so heavy that flash floods are common throughout the year, hence all houses are built on 'stilts.' The frequent flooding means there are rather few ground-dwelling molluscan species in the Solomons. One exception is *Subulina octona* (Bruguière, 1792), shown on the right. In this 20.9mm specimen, two eggs are clearly visible.



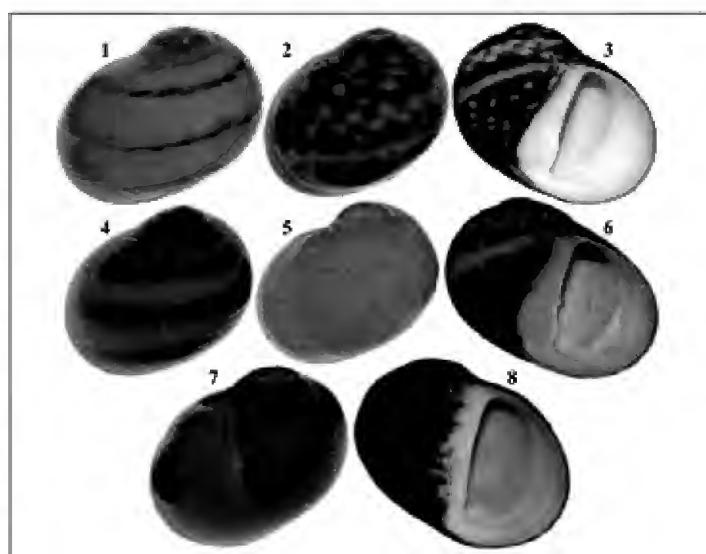
(Above) The Solomons is a delight for arachnophiles. *Argiope keyserlingi* Karsch, 1878, is often known as the "St Andrew's Cross spider." Spiders of this genus typically hold their legs in pairs so as to form an 'X' shape, with their head pointed downwards.



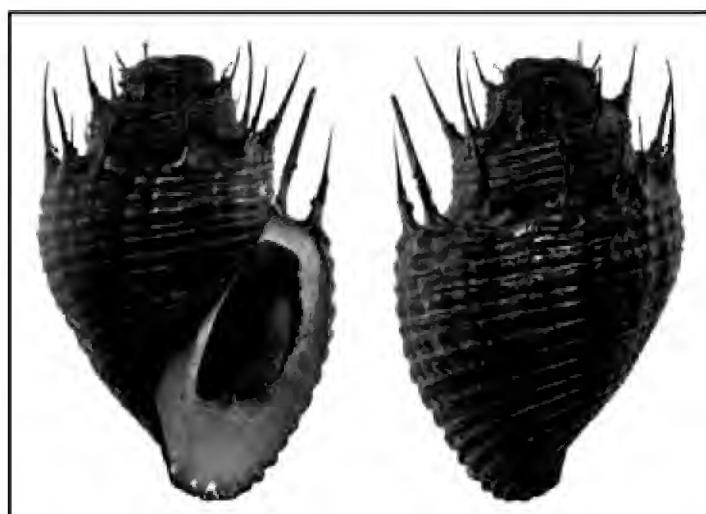
(Above) George from Suhu village collects in the Marau jungle. The shell he is reaching – at 8ft off the ground – is the ‘freshwater’ snail *Neritodryas cornea* (Linnaeus, 1758). A complete surprise in this habitat was that a supposed freshwater species exploited such a niche; live *Neritodryas* were common among this vegetation, a considerable distance from flowing water.



(Above) This bizarre spiny-backed orb-weaver (*Gasteracantha* sp.) was widespread and common. The islanders believe it is venomous.



(Above) Variation in *Neritodryas cornea* (1–6; 21–25mm) from the Marau jungle. It is likely that the variety with a yellow aperture (6) will be described as a separate species in the future. *Neritodryas subsulcata* (Sowerby, 1836) (7, 8; 24mm) is a related species that can easily be confused with *N. cornea*. The black mottling on the parietal shelf of *N. subsulcata* is characteristic. Both of these species are primarily arboreal, yet there are plenty of data slips in existence that incorrectly list “freshwater stream” or “lake” as the habitat. On the other hand, little is known of the reproductive traits of this genus and it is probable that they return to water to lay eggs.



(Above) *Thiara cancellata* Röding, 1798, is neither rare nor endemic to the Solomons. Finding specimens with their spines intact was truly satisfying, however. This 30.7mm specimen is from the Vilavila River in Guadalcanal. As the river flows out into Marau Sound it joins the Vainihaka River and several interesting freshwater species are found: *Thiara winteri* von dem Busch, 1842; *Tarebia granifera* (Lamarck, 1822); *Melanoides aspirans* (Hinds, 1847); the ubiquitous *Faunus ater* (Linnaeus, 1758); *Neripteron dilatatum* (Broderip, 1833); *Neritina variegata* (Lesson, 1831); long-spined *Clithon donovani* Récluz, 1843; *Septaria porcellana* (Linnaeus, 1758); and the endemic bivalve *Hyridella guppyi* (Smith, 1885).



(Above) The giant helmeted katydid (*Phyllophorella woodfordi* Kirby, 1899) is an expert at camouflage. This individual was spotted in a thickly-forested swamp in Marau.



(Above) A green-bellied tree skink, *Emoia cyanogaster* (Lesson, 1826), in the jungle on New Georgia. A much larger cousin of this small lizard is the endemic Solomon Islands skink *Corucia zebrata* Gray, 1856, a nocturnal herbivore with a prehensile tail. At 31 inches it is the largest skink in the world.



Throughout my travels in the Solomons I found the villagers friendly, very hospitable, and more than willing to help collect shells – especially the children. This photo shows the people of Suhu village, gathered on the beach after a day of collecting *oe*. My sincere thanks to the people of Suhu, Vutu, and Hautahe in Marau, especially Morris, Priscilla, George, and Joe, and all the villagers of Kiapatu in New Georgia, especially Sycamore and his family. For assistance with this article I thank Tom Eichhorst, Mike McCoy, and G. Thomas Watters. In particular, I thank André Delsaerdt for his expert help with the identification of Solomon Island landsnails.

All photographs appear courtesy of Simon's Specimen Shells Ltd (www.simons-specimen-shells.com)

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Threetooth ID ruminations open a centuries-old amphi-Atlantic Pandora's Box

Harry G. Lee



Triodopsis messana Hubricht, 1952, pinhole three-tooth, Georgia, Upson Co., Thomaston, Roland Rd., ca. 7 miles W town, under fallen limb resting on cleared area immediately adjacent to lawn. Collected by Billie Brown, 30 October 2010.

The genus *Triodopsis* Rafinesque, 1819: 425, as currently interpreted (Emberton, 1988), is widely distributed in eastern North America, particularly the southeastern US. The type species of the genus, *T. lunula* Rafinesque, 1831 (= *Helix tridentata* Say, 1817), is a story in itself. (See the note on the type of *Triodopsis* beginning on p. 14.) The conchological identification of the slightly fewer than 30 species of these so-called “threetooths” is based on apertural dentition, tightness of coil, umbilical diameter, axial sculpture, pigmentation of fresh material, and zoogeography (see <<http://www.jaxshells.org/triodopsis.htm>>). That may seem simple enough, but other factors add a degree of difficulty possibly unique to this genus. There is convincing evidence of hybridization among species and, consequent in part to the ability of some taxa to prosper in human-altered environments, numerous anthropogenic introductions have confused what was certainly a more orderly zoogeographic mosaic before the European immigration. Furthermore, significant intraspecific variation, evident even within a single population, may add complexity.

On the other hand, last year Bill Frank and I created a simple compendium of single images of each of the 28 generally-recognized species of threetooths (cited above), so I thought identification of four living threetooths taken by Jacksonville Shell Club (JSC) member Billie Brown in Thomaston, Georgia, would be greatly facilitated. Hours later, I realized that “greatly” was a bit a generous for a description of the ultimate campaign. For openers, these snails didn’t quite match anything in the website portfolio! After ransacking my library, I found a much better match - es-

sentially perfect: paratypes of *T. affinis* Hubricht, 1954, figured by Grimm (1975: fig 2D). *T. affinis* is regarded by certain authorities as a stable hybrid between *T. fallax* (Say, 1825) and *T. alabamensis* (Pilsbry, 1902) and not recognized by Turgeon, Quinn, et al. (1998: 153). Almost satisfied, I then delved a little deeper and found that Hubricht (1954: 28-30) stated “the only difference between *T. messana* Hubricht and *T. f. affinis* is in the color.” As unusual as this dependence on shell coloration struck me, Grimm (1975) seemed to have been in agreement. Next, the original descriptions were consulted. Hubricht (1952: 80-81) characterized *T. messana* as “reddish brown” [later “dark red-brown to walnut brown” by Grimm (1975)]. The largest in his cited type series (five) was 15.0mm in maximum diameter, and he remarked on the variability of the outer lip tooth, in some “pointed and little if any inflected; in others broadly rounded and deep-seated.” He cited Pilsbry (1940: 810: fig. 480 C), but did not otherwise figure this species. In his description of *T. fallax affinis* (Hubricht, 1954), he used “deep olive buff to wood brown” to describe the shell, the largest of his cited type series (five) was 13.3mm, and no figure was provided.

Both the latter taxa are anthropochorous, meaning able to live in human-altered environments (Hubricht, 1952, 1954, 1971, 1984, 1985; Grimm, 1975), which is consistent with the habitat in which Billie collected her snails. Both species potentially occur in Upson Co., GA (Hubricht, 1985), where the topical specimens were found, and neither seems to have an authentic figure other than those cited, all graytones. On the one hand, her shells match

T. affinis more than they do *T. messana* based on figures in Pilsbry (1940: fig 480 c) and Grimm (1975; figs. 1E, 1F, 2D) in having a more laterally-expanded aperture and a tighter coil. On the other hand, (1) shell color, definitely red brown and darker than the tones indicated for *T. affinis*, (2) size (from 13.3 to 14.7mm; three of them over 14.0mm), (3) outer lip tooth variability (strikingly evident in these four shells), and (4) Hubricht's (1954) remark about the remarkable similarity between the two taxa, impel me to conclude that Billie's shells are better referred to *T. messana*. I feel reasonably confident, based on years of observing variability in

this genus, that this is a true instance where a taxonomic determination is better made relying on the salients in the written description than with primary reliance on (authentic) illustration(s). The images provided with this report are intended to add a dimension to the identity of *Triodopsis messana*, a valid bio-species with a confusing assortment of characters, some variable and others constant. *T. messana*, misleadingly dubbed the “pinhole threetooth,” apparently based on the relative size of the umbilicus as seen in the type figure. Nonetheless, this is one of those variable characters.

- A note on the type species of *Triodopsis* -

Although Rafinesque (1819: 425; taken from Binney and Tryon, 1864: 27, my Fig. 1 below) gave an adequate description of the genus and mentioned “plusieurs espèces,” he cited none by name. Andre Étienne Just Pascal Joseph François d’Audebard, Baron de Féruccac (1786-1836) was in correspondence with Rafinesque, who apparently sent material to him in Paris. He introduced Rafinesque’s manuscript name, *Triodopsis lunula*, in the synonymy of *Helix tridentata* Say, 1817 (Férussac, 1821: 34, species 105; my Fig. 2). Presently *T. lunula* Féruccac is treated as an unavailable name. A relevant provision in the *Code* (ICZN, 1999) is Article 11.6 Publication as a Synonym, which reads: “A name which when first published in an available work was treated as a junior synonym of a name then used as valid is not thereby made available.” One relevant exception immediately follows (11.6.1): “However, if such a name published as a junior synonym had been treated before 1961 as an available name and either adopted as the name of a taxon or treated as a senior homonym, it is made available thereby but dates from its first publication as a synonym.” Although Rafinesque’s (1831: 3; from Binney and Tryon, 1864: 68, my Fig. 3) usage, is iffy since he didn’t cite Féruccac, to date it appears that no one, including Pilsbry (1930: 322-323; Pilsbry, 1940: 790; Fig. 4) seems to have “adopted” (treated as valid) *T. lunula* Féruccac, 1821, “as the name of a taxon.” The reference to *Helix tridentata* Say as a synonym is not treatment as valid. Further, no author has ever produced an indication for *T. lunula* other than this synonymy, and authorities would probably regard the binomen as a nude name and thus unavailable for taxonomic nomenclature.

87. *TRIODOPSIS*. Différent du genre *Helix* par un grand ombrille, comme dans le genre *Mesomphix*, et en outre, par lèvres épaisses, ouverture rétrécie par 3 dents, une sur chaque lèvre et une sur la spire. Plusieurs espèces.

Fig. 1

N° 105. *TRIDENTATA* T. & J., SAY, Nicholson's Encyc., art. Conchology.
Linn., Synopsis, tab. 91, f. 9a.
Triodopsis lunula, RAFINESQUE.
Habit. Les Etats-Unis; Comun. SAY et RAFINESQUE. Le Canada, les forêts du Beauve Saint-Laurent, la Pennsylvanie, etc. par MULBERT.

Fig. 2

29. *TRIODOPSIS*, Raf. 1819. Differ *Helix*, opening with 3 teeth. 2 above, 1 below, an ombrille. 1. *Tr. lunula*. Depressed, mouth narrow with thick lips, ombrille longitudinal. In Kentucky. Forms S. G. *mesomphix*.

Fig. 3

Fig. 4

TRIODOPSIS Rafinesque
Triodopsis Rafinesque, 1819, Journ. de Physique, de Chimie, d'Hist. Nati., 88: 426.
Cf. Féruccac, 1821, Tabl. Syst. Fam. Lamprons, p. 31, no. 105 (*Triodopsis lunula* Raf. in synonymy of *Helix tridentata* Say).
Mesomphix Rafinesque, 1831, Encyc. and Art., etc., p. 3. (Subgenus of *Tridulus* for *Triodopsis lunula* Raf.)
Tridulus Agassiz, 1840, Nomenclator Zool. Index Universalis, p. 323. (Emendation of *Triodopsis*)
Triodopsis Raf., in part, Beck, 1857, Index Molluscarum, p. 24.

Also without description, the Baron cited other (Rafinesque manuscript) names as belonging in *Triodopsis*, e.g., *T. clausa* Raf. and *T. scabra* Raf., but he did not indicate a type for the genus. In fact he considered them all to belong to his *Helix* (*Helicodonta*), now considered to be an Old World species-group. The type of *Triodopsis* was designated by its original author twelve years after its introduction: *Triodopsis lunula* Rafinesque, 1831 (Fig 3) in a rarely-witnessed nomenclatorial act, “subsequent monotypy.” The appearance that Rafinesque never gave consideration to the nominal taxon *Helix tridentata* Say is misleading. Quite possibly it resulted from a nomenclatorial convention of the day, and utilized frequently in his opera, of replacing the species epithet when a taxon was reassigned from its original genus. He was certainly aware of Say (1817) as he often cited it in his other works and he may have thought it to be synonymous with his *T. lunula*.

Since there was apparently no relevant name-bearing Rafinesque specimen ever presented in the literature (e.g., Pilsbry, 1930: 322-323; Pilsbry, 1940: 790-797), an inquiry was placed on 10 November 2010, at the Muséum National d’Histoire Naturelle, Paris (MNHN), the repository of much of the Baron’s collection (Sherborn, 1940: 51). It seemed to me that should the shell(s) he called “*Triodopsis lunula* Raf.” belong to a species other than *T. tridentata* (Say, 1817) (i.e., what if the Baron’s synonymy was incorrect?) another chapter in this byzantine chronicle might be necessitated.

Mirabile dictu; not too long afterward, Virginie Héros, MNHN Chargée de Conservation, Collection Mollusques, located two shells (Figs. 5a, 5b) belonging to Féruccac and labeled *Triodopsis lunula* Rafinesque, the earlier probably in the Baron’s hand (Figs. 6a, 6b). There are two important discoveries here: (1) This two-specimen lot is composed of different species: Fig. 5a: *Triodopsis tridentata* (Say,

1817) and Fig. 5b: *T. vulgata* Pilsbry, 1940. (2) The specimens almost certainly originated with Rafinesque. At the time he likely sent the shells to the Baron (ca. 1820), Rafinesque was in north-central Kentucky, and it was likely here that he collected 5b. The label appears to read "at. labiata." Does this mean "at[que] [forma] labiata?" indicating Rafinesque knowingly included a second form, likely collected in Kentucky, in this lot? We'll probably never know. Nonetheless, since the genus *Triodopsis* is based on this lot, it seems prudent to declare that only shell 5a, not 5b, is *T. lunula* Rafinesque, which species authors have come to regard as a synonym of *Helix tridentata* Say, and the type of *Triodopsis* Rafinesque, 1831. In other words, we're cutting the Baron some slack on his synonymy and preventing potential fallout which would destabilize the taxonomy and nomenclature of both the genus *Triodopsis* and the species *T. vulgata*. Although Say's description and figure are inadequate to define *T. tridentata*, and he apparently left no type material, Pilsbry (1940: 796; Fig. 474a) removed any doubt as to its identity by designating a neotype from SE Pennsylvania in the collection of the Academy of Natural Sciences, Philadelphia (ANSP).

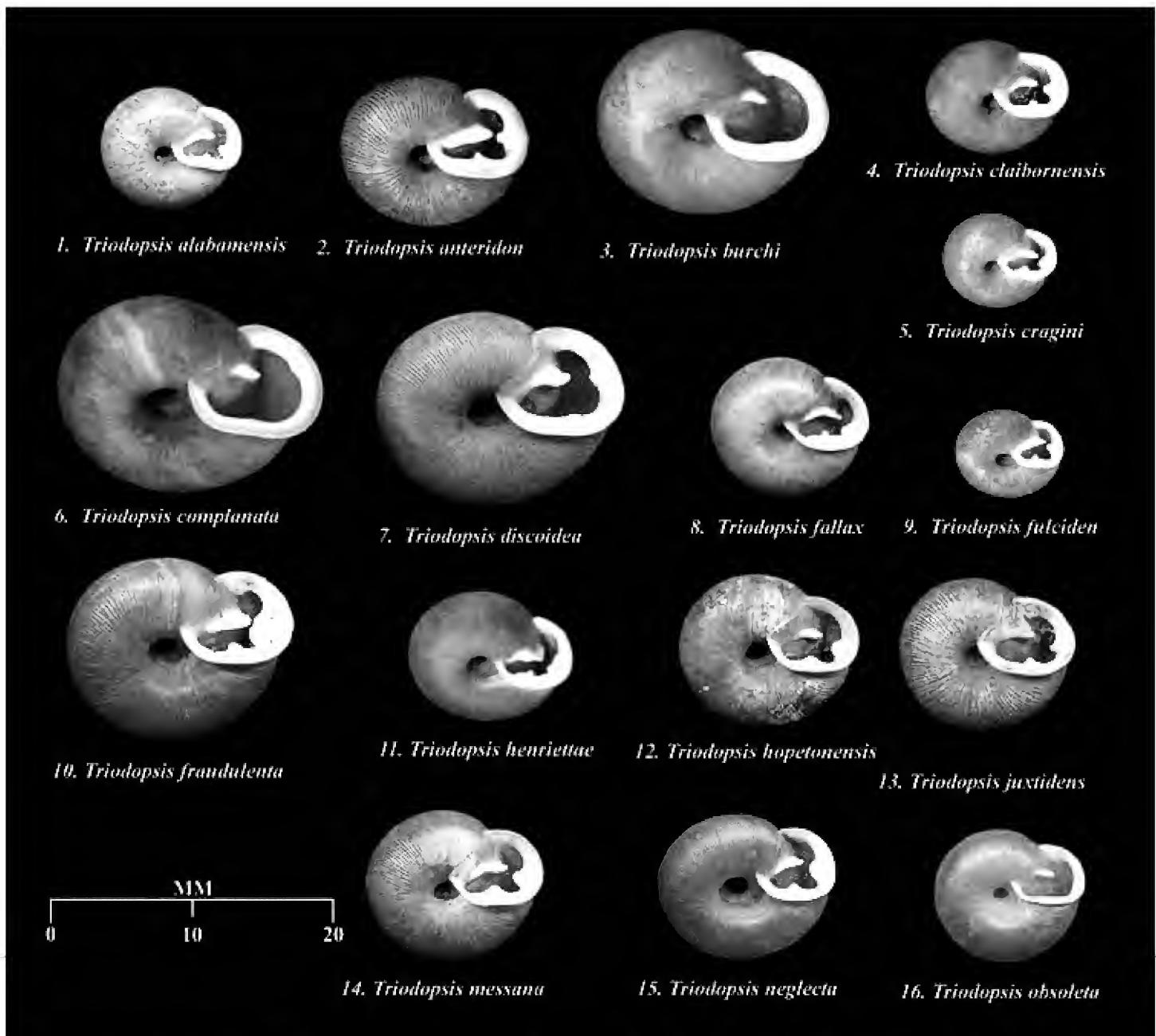
The author is indebted to Billie Brown for her unflagging attention to landsnails during her many peregrinations, to Philippe Bouchet (MNHN), Dick Petit (North Myrtle Beach, SC), and Gary Rosenberg (ANSP) for enlightening discussions related to the taxonomic and nomenclatorial quirks involved in this probe. Virginie Héros and Philippe Maestrati (MNHN) provided vital curatorial and photographic contributions (respectively), and Bill Frank (Jacksonville) gave technical assistance in several aspects of the preparation of this report. Deft editing by Tom Eichhorst and Bruce Neville greatly improved this report from its manuscript form.

Literature cited:

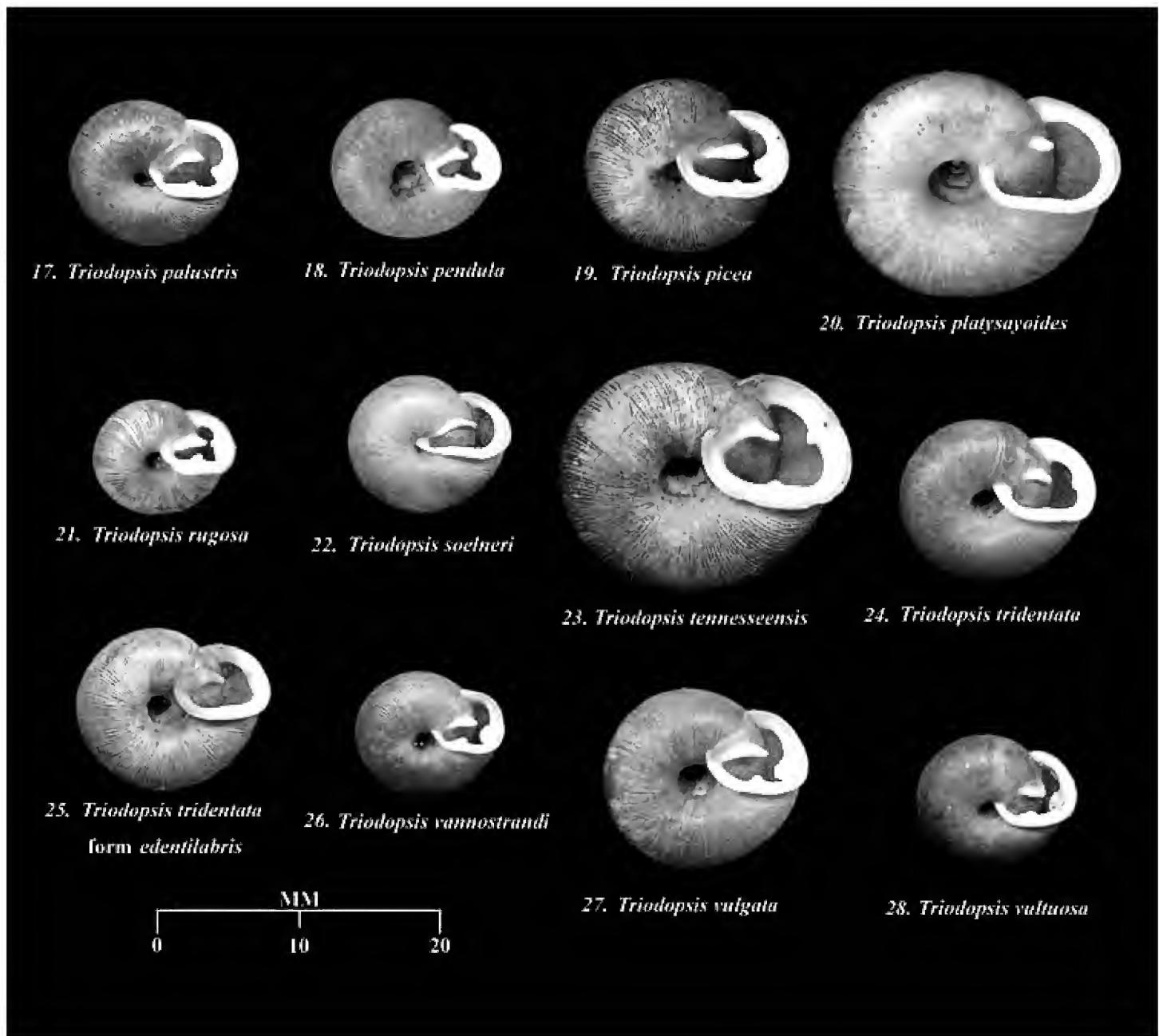
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An electronically-enhanced and slightly expanded version of this report is available at <<http://www.jaxshells.org/messana.htm>>.



1. *Triodopsis alabamensis* (Pilsbry, 1902), Alabama Threetooth (Putnam Co., GA) [S VA to SE TN & SE AL].
2. *Triodopsis anteridon* Pilsbry, 1940, Carter Threetooth (Wyoming Co., WV - Field Museum of Natural History (FMNH) 264768) [E KY, SW WV & VA to NE TN].
3. *Triodopsis burchi* Hubricht, 1950, Pittsylvania Threetooth (Roanoke Co., VA - FMNH 266240) [VA & NC].
4. *Triodopsis claibornensis* Lutz, 1950, Claiborne Threetooth (Campbell Co., TN - FLMNH 264399) [NE TN].
5. *Triodopsis cragini* Call, 1886, Post Oak Threetooth (Claiborne Parish, LA - FMNH 266248) [SW MO & SE MO to E TX & W LA].
6. *Triodopsis complanata* (Pilsbry, 1898), Glossy Threetooth (Pulaski Co., KY - FMNH 266277) [SC KY & NC TN].
7. *Triodopsis discoidea* (Pilsbry, 1904), Rivercliff Threetooth (Crawford Co., IN) [SW OH to SE MO].
8. *Triodopsis fallax* (Say, 1825), Mimic Threetooth (Camden Co., NJ) [PA to TN & NC].
9. *Triodopsis fulciden* Hubricht, 1952, Dwarf Threetooth (Catawba Co., NC - [PARATYPE] FMNH 266316) [SW NC].
10. *Triodopsis fraudulenta* (Pilsbry, 1894), Baffled Threetooth (Rockbridge Co., VA) [PA, WV, & VA].
11. *Triodopsis henriettae* (Mazýck, 1877), Pineywoods Threetooth (Brazos Co., TX - FMNH 266325) [NE TX].
12. *Triodopsis hoptonensis* (Shuttleworth, 1852), Magnolia Threetooth (Davidson Co., TN) [most of the SE].
13. *Triodopsis juxtidentis* (Pilsbry, 1894), Atlantic Threetooth (Durham Co., NC) [NJ to WV & GA].
14. *Triodopsis messana* Hubricht, 1952, Pinhole Threetooth (Horry Co., SC) [VA to FL].
15. *Triodopsis neglecta* (Pilsbry, 1899), Ozark Threetooth (Barry Co., MO) [MO, KS, OK, & AR].
16. *Triodopsis obsoleta* (Pilsbry, 1894), Nubbin Threetooth (Dare Co., NC) [MD to E NC].



17. *Triodopsis palustris* Hubricht, 1958, Santee Threetooth, (Long Co., GA) [E SC to NE FL].

18. *Triodopsis pendula* Hubricht, 1952, Hanging Rock Threetooth (Iredell Co., NC - FMNH 266352) [WC NC].

19. *Triodopsis picea* Hubricht, 1958, Spruce Knob Threetooth (Pocahontas Co., WV - FMNH 266426) [SW PA & WV].

20. *Triodopsis platysayoides* (Brooks, 1933), Cheat Threetooth (Monongalia Co., WV - FMNH 266693) [N WV].

21. *Triodopsis rugosa* Brooks and MacMillan, 1940, Buttressed Threetooth (Logan Co., WV - FMNH 264690) [SW WV].

22. *Triodopsis soelneri* (Henderson, 1907), Cape Fear Threetooth (Columbus Co., NC) [SE NC];

23. *Triodopsis tennesseensis* (Walker and Pilsbry, 1902), Budded Threetooth (Cleburne Co., AL) [SW VA & SE TN to E AL].

24. *Triodopsis tridentata* (Say, 1816), Northern Threetooth (Mitchell Co., NC) [NH & MI to GA & MS].

25. *Triodopsis tridentata* (Say, 1817), form *edentilabris* Pilsbry, 1894, Northern Threetooth [toothless morph] (Haywood Co., NC) [sporadic NH & MI to GA & MS].

26. *Triodopsis vannostrandi* (Bland, 1875), Coiled Threetooth (Okaloosa Co., FL) [SC to FL & AL].

27. *Triodopsis vulgata* Pilsbry, 1940, Dished Threetooth (Nelson Co., KY) [W NY & WI to GA & MS].

28. *Triodopsis vultuosa* (Gould, 1848), Texas Threetooth (Marion Co., AR) [E TX & SW LA].

I thank Drs. Jochen Gerber and Stephanie Clark of the Field Museum of Natural History (Chicago) for curatorial and technical assistance in the production of this plate. Bill Frank and Tom Eichhorst provided further editorial services. The geographic ranges [in brackets] are based on Hubricht (1985) with minor modifications based on unpublished data. Harry G. Lee

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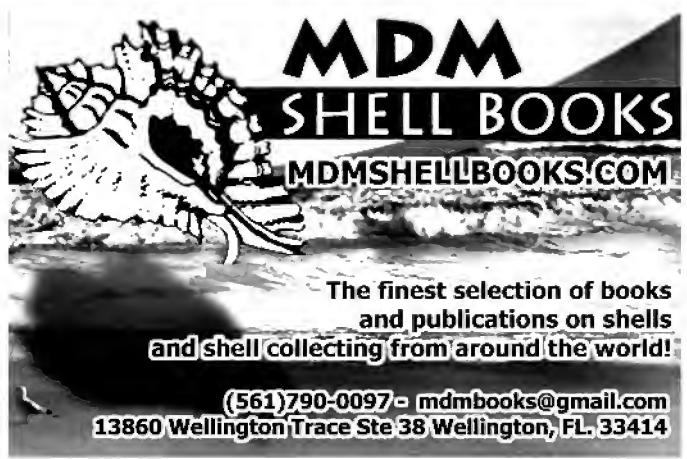
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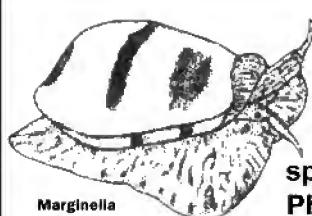
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PHILADELPHIA

Shell Show



OCTOBER 1

OCTOBER 2

AT THE ACADEMY OF NATURAL SCIENCES

WWW.PHILLYSHELLCLUB.ORG

Mid-Atlantic Malacologists Meeting

Elizabeth K. Shea¹, Leslie Skibinski¹ and Aydin Örstan²

¹Department of Mollusks, Delaware Museum of Natural History, Wilmington, DE 19010

²Research Associate, Section of Mollusks, Carnegie Museum of Natural History
Pittsburgh, PA, U.S.A



Fig. 1 Mid-Atlantic Malacologists participants photographed outside the Delaware Museum of Natural History. Picture courtesy of Happy and Robert Robertson.

Back row: Bill Fenzan, Charlie Sturm, Phil Fallon, Colleen Sinclair Winters, Tim Pearce, Tom Grace, Makiri Sei, Paul Callomon, John Kucker, John Wolff, Kevin Ripka, Matt Blaine, Clem Counts

Middle row: Francisco Borrero, Robert Robertson, Al Spoo, Adam Baldinger, Leslie Skibinski, Paula Mikkelsen, Amanda Lawless, Elaina McDonald, Judy Goldberg, Lois Kucker, Happy Robertson, Dona Blaine

Front row: Megan Paustian, Laura Zeller, Liz Shea, Marla Coppolino, Aydin Örstan, Beysun Örstan

The Mid-Atlantic Malacologists (MAM) Meeting was held on March 19, 2011, at the Delaware Museum of Natural History in Wilmington, DE. Thirty-four professional, amateur, novice, and experienced malacologists were in attendance (Fig. 1). As usual, we drew from a large geographical range, with participants from Norfolk, VA, Cambridge, MA, and Cincinnati, OH, included in our definition of Mid-Atlantic.

This informal meeting, and its sister-meetings: Southern California Unified Malacologists (SCUM), Bay Area Malacologists (BAM), Ohio Valley Unified Malacologists (OVUM), and now the Florida United Malacologists (FUM), serve as a mixing bowl of molluscan people and topics. Emeritus curators mix with artists and university faculty meet shell club members. The talks are always an eclectic mix of What's Happening Now in malacology. This year was no exception – we heard an audio recording of land snails eating carrots, learned about designing snail identification software for an iPhone (there's an app for that!), and how the Academy of Natural Sciences in Philadelphia is using "Wall-E," a computer with voice recognition software lashed to a hospital cart to inventory their collection for the first time in 200 years. All in

all, 16 full talks and 1 poster were presented, and 10 people used the Mollusk collection and library.

The following list of speakers and brief summaries of their presentations, known as the "Bootleg Transactions," can be found on Aydin's blog: <http://snailstales.blogspot.com/2011/03/bootleg-transactions-of-13th-mam.html>

Additional comments are welcome!

- **Marla Coppolino** (New York): Marla played the rasping sounds of her pet snails' radulae recorded while they were eating a carrot. The snails were *Mesodon zaletus*.
- **Charlie Sturm** (Carnegie Museum of Natural History, Pittsburgh): Charlie, the current President of the American Malacological Society, is organizing the 77th meeting of the society to take place 23-38 July 2011 in Pittsburgh, PA. Be there!
- **Paul Callomon** (Academy of Natural Sciences, Philadelphia): The mollusk collection of the ANSP is being recataloged with the help of voice-recognizing software.
- **Paula Mikkelsen** (Paleontological Research Institution, Ithaca): Paula presented an overview of the history of publish-

- ing in malacology. In 1959, 485 papers containing the word “mollus*” were published, while in 2009 their number had gone up to 2058.
- **Tim Pearce** (Carnegie Museum of Natural History, Pittsburgh): Tim presented his ideas on the evolution of slugs from snails. He is trying to answer the question, “Why is it good to be a semi-slug?”
 - **Lynn Dorwaldt** (Wagner Free Institute of Science, Philadelphia): History of the Wagner Free Institute of Science and also the bivalves from Isaac Lea’s collection that are kept at the Institute. Some 19th century malacology books from the Institute’s library were passed around (Fig. 2).
 - **Robert Robertson** (Academy of Natural Sciences, Philadelphia): According to Gunner Thorson’s (1950) shell apex theory, protoconch morphologies reflect modes of larval development. Robert’s research shows that the theory doesn’t apply to the Pyramidellidae.
 - **Tom Grace** (Pennsylvania): New records of freshwater mussel *Margaritifera* in the headwaters of the Schuylkill River.
 - **Aydin Örstan** (Carnegie Museum of Natural History, Pittsburgh): Aydin presented his developing ideas on the breathing anatomy of semi-terrestrial snails in the superfamily Rissooidea.
 - **Bill Fenzan** (Virginia): The 1st International Cone Meeting was in Stuttgart, Germany in October 2010. The next meeting will be in La Rochelle, France in September 2012 (for more info see *The Cone Collector*: <http://www.theconecollector.com/>).
 - **Makiri Sei** (Academy of Natural Sciences, Philadelphia): Makiri talked about her ongoing project with Gary Rosenberg on the phylogeny of Jamaican Annulariidae based on DNA sequences.
 - **Kevin Ripka**: Kevin, a birder who recently got interested in snails, is developing an iPhone application for Northeast U.S. land snails.
 - **Adam Baldinger** (Museum of Comparative Zoology, Harvard University): Adam talked about the various mollusk models at MCZ among which are a large number of glass mollusks and other invertebrates made by Leopold and Rudolf Blaschka (Fig. 3).
 - **Megan Paustian** (Carnegie Museum of Natural History, Pittsburgh): Megan talked about the ecology and species of the slugs in the genus *Meghimatiom* in Japan. She also showed slides from her trip there.
 - **Francisco Borrero** (Cincinnati Museum Center): Francisco and his colleague Abraham Breure are studying the taxonomy and biogeography of the Orthalicoidea from Colombia and adjacent areas.

MAM was originally intended to travel from venue to venue, extending the reach and the mix of participants. If you have been lurking and would like to consider hosting the meeting, please get in touch with Liz (eshea@delmn.org) or Leslie (lskibinski@delmn.org) to discuss the planning process.

See you next year for another Molluscan March Madness!



Fig. 2 William Wagner founded the Wagner Free Institute of Science in Philadelphia, PA. His strong interest in conchology, along with a commitment to public lectures and free education form a lasting legacy of the Wagner. Photo by Tom Crane.

Fig. 3 Adam Baldinger described the restoration of the glass Blaschka models at the Museum of Comparative Zoology. The pelagic *Argonauta argo* Linnaeus, 1758, and her egg case are one of many spectacular cephalopod displays. Courtesy of Museum of Comparative Zoology, Harvard University.



2011 Sarasota Shell Club Award Winners

Ron Bopp, President and Awards Chairman

Sarasota Shell Club



The Sarasota Shell Club Shell Show moved to a new venue for 2011. This meant more room, more displays, more vendors, and in general, an excellent show. Attached are some photos of some of the winners and displays. The Sarasota Shell Club meets on the second Thursday of each month from September through April. The agenda includes a program of interest to shell collectors and a short business meeting. Meetings start at 7:00 p.m. and are held at the Mote Marine Laboratory.

Contact: info@sarasotashellclub.com



Mote Gold Trophy: Martin Tremor & Conrad Forlor, "Helmets and the Bonnets of it all"



DuPont Trophy: Martin Tremor & Conrad Forlor, "Behold the Lovely Abalone."



Sandy Pillow presents the COA Award to Jeanette Tyson and Ed Schuller for their presentation, "Mystery of the Migrating Mollusk."



COA Trophy: Jeannette Tyson & Ed Schuller, "Mystery of the Migrating Mollusk."



The Hertweck Fossil Trophy went to Ron Bopp (SSC member) for "Sagittal Sections of Fossil Shells."



Best Self-collected Exhibit Trophy: James & Bobby Cordy, "Shells of Eleuthera."



Fossil Shell of the Show: Dale Stream, *Siphocypraea griffini*.



Best of Art with Shell Motif Trophy: Charles Barr, "Big Eye" photograph.



Fran Schlusemann Best of Member's Art Trophy: Carolyn Madden, "Single Valentine."

Images not available for Sarasota Shell Club Members Trophy: Lynn Gaulin, "North & South American Epitoniums" and Best Small Scientific Exhibit Trophy: Lynn Gaulin (SSC Member), "North & South American Epitoniums."



June Bailey Best of Shell Art Trophy presented by Sandy Pillow to Carl Hichman (SSC Member) for "Bridal Bouquet."



2011 Broward Shell Show

Nancy Galdo



The 2011 Broward Shell Show was one of the Broward Shell Club's best ever... a record breaking show! Our membership increased by 1/3 and attendance was up this year with regulars and South Florida residents alike. There were many new newcomers who discovered the wonder of shells for the first time. The show's success can be credited to

the incredible effort put forth by the entire Broward Shell Club membership. Thanks to each person who contributed their time, effort, and donations. The exhibitors, dealers in attendance, Broward club members, and volunteers make this event possible.

SHELL SHOW AWARDS

--Scientific--

AMERICAN MUSEUM OF NATURAL HISTORY: Sheila L. Nugent, "Gulf of Maine/Bay of Fundy EcoRegion"

CONCHOLOGISTS OF AMERICA: Norman Terry, "It's A Small Small World"

THE DUPONT TROPHY: Harry Berryman, "Family Costellariidae"

BEST FLORIDA/CARIBBEAN EXHIBIT: Bob Pace, "29 Species of Marine & Land Shells Found In About 45 Minutes"

NEIL HEPLER MEMORIAL TROPHY FOR EDUCATIONAL EXCELLENCE: Carole Marshall, "Gods, Goddesses, Shells and Money"

BETTY HAMANN FOSSIL AWARD: Valentino Leidi, "South Florida Fossils"

LEN HILL MEMORIAL AWARD FOR MOST BEAUTIFUL EXHIBIT: Norman Terry, "It's A Small Small World"

BEST OF THE BEST: Gene Everson, "Seashells of the New Millennium 2000-2009 - Self-Collected"

SHELL OF SHOW (self-collected): Bob Pace, *Bursa grayana*

SHELL OF SHOW (any manner): Sonny Ogden, *Tridacna gigas*

BEST STUDENT EXHIBITOR: Valentino Leidi, "South Florida Fossils"

PEOPLE'S CHOICE AWARD – SCIENTIFIC: Jonathan Galka, "Fossil Mollusks of South Florida"

BEST BEGINNING EXHIBITOR – SCIENTIFIC: Sonny Ogden, *Tridacna gigas*

STUDENT (grades K through 6, any manner): Katherine Albert, "Fossilized Turban Shell"

STUDENT (grades 7 through 12, any manner): Valentino Leidi, "South Florida Fossils"

ONE REGION (self-collected): Bob Pace, "29 Species of Marine & Land Shells Found In About 45 Minutes"

ONE REGION (any manner): Sheila L. Nugent, "Gulf of Maine/ Bay of Fundy EcoRegion"

ONE FAMILY(MAJOR, any manner): Kenneth Brown, "Sampling of Family Cypraeidae"



The 46th annual Broward Shell Club Shell Show was held at the Emma Lou Olson Center, in Pompano Beach, Florida. This is also where the club holds its monthly meetings on the second Wednesday of each month at 6:45 p.m. Annual dues are \$18 for an individual or family, \$5 for a student (up to high school), and \$20 international.

ONE FAMILY (MINOR, any manner): Harry Berryman, "Family Costellariidae"

ONE SPECIES (any manner): Blue - Sheila L. Nugent, *Nucella lapillus*

Red - Ken Curry, Sr., "See the many faces of *Scaphella junonia*"

SINGLE SHELL WORLDWIDE (self-collected): Blue - Sonny Ogden, *Tridacna gigas*

Red - Gene Everson, *Conus gauguini*

SINGLE SHELL WORLDWIDE (any manner): Blue - Gene Everson, *Eupleura volkesorum*

Red - James Cordy - *Nodipecten*

SINGLE SHELL - FLORIDA CARIBBEAN (self-collected): Blue - James Cordy

Red - Bob Pace, *Bursa grayana*

White - Amy Tripp, *Arcinella cornuta*

Judge's Special Merit Ribbon & White: Hugh Andison, albino horse conch

FOSSILS (any manner): Blue - Harry Berryman, *Placenticeras placenta* (fossil ammonoid)

Red - Jonathan Galka - Fossil Mollusks of South Florida

LAND or FRESH WATER SHELLS (any manner): Judge's Special Merit Ribbon & Blue - Harry G. Lee, "Terrestrial Pulmonata"

EDUCATIONAL: Blue - Carole Marshall, "Gods, Goddesses, Shells & Money"

--Artistic--

BEST BEGINNING EXHIBITOR (artistic): Jo-Ann Connolly, mirror wreath



Norman Terry won the COA Award as well as the Len Hill Memorial Award (for most beautiful exhibit) for his exhibit, "It's a Small Small World."

BEST STUDENT EXHIBITOR (artistic, made by exhibitor): Katherine Albert, "Simply Paradise"

BEST IN SHOW – HOBBYIST (made by exhibitor): Bob Pace (novelties category), "Animal Caricatures"

BEST IN SHOW – PROFESSIONAL (made by exhibitor): Jae Kellogg, flower arrangement on driftwood

BEST IN SHOW – SAILOR'S VALENTINE (any manner): Brandy Llewellyn

FAY MUCHA MEMORIAL TROPHY BEST COLLECTIBLES (any manner): Linda Zylman Holzinger, hand carved antique pearl oyster in olivewood frame from Jerusalem

PEOPLE'S CHOICE AWARD - ARTISTIC DIVISION: Brandy Llewellyn, "Sailor's Valentine"

--Hobbyist--

STUDENT (Grades K – 6): Blue - Katherine Albert, "Simply Paradise"

MIRROR: Blue - Jo-Ann Connolly

Red - Jo-Ann Connolly

DÉCOR – TABLETOP ONLY: Red - "Shell Encrusted Head"

PHOTOGRAPHY: Judge's Special Merit Ribbon & Blue - Kevan Sunderland, "Willet with *Melongena*"

Red - Sheila L. Nugent

White - Anne Dupont

JEWELRY and PERSONAL ACCESSORIES: Blue - Sue Burns & Mario Piras

Red - Elaine Alvo

NOVELTIES: Blue - Bob Pace, "Animal Caricatures"

Red - Elaine Alvo, "The Collector"

SPECIAL: Blue - Sue Burns & Mario Piras

--Professional--

FLOWER ARRANGEMENT (6" or less, tabletop): Blue - Brandy Llewellyn

FLOWER ARRANGEMENTS (greater than 6," tabletop):

Judge's Special Merit Ribbon & Blue - Jae Kellogg

SAILOR'S VALENTINE (single, tabletop): Blue - Brandy Llewellyn

MIRROR (wall hung): Blue - Heather Strawbridge

SHELL TABLES or TRAYS: Blue - Jon Ogden

DÉCOR (wall hung): Red - Heather Strawbridge

DÉCOR (tabletop): Blue - Heather Strawbridge

--Collectibles--

Blue – Linda Zylman Holzinger, hand carved antique pearl oyster in olivewood frame from Jerusalem

Red – Heather Strawbridge, Princess Charming purse collection

Red – Richard Sedlak & Michael Hickman, *Nautilus* representations

St. Petersburg Shell Club Shell Show



The 64th Annual Shell Show of the St. Petersburg Shell Club was held in Seminole, Florida, on 26-27 February 2011. As usual there were a great number of crowd-pleasing shell displays. The St. Pete Shell Club was formed over 70 years ago and meets on the second Friday of each month (except March when it is the third Friday) at 7:00 p.m. at the Seminole Rec Center, 9100



Martin Tremor Jr. (left) and Conrad Forler (right) won the COA Award for their exhibit "Behold the Lovely Abalone: Abalone of the West Coast of North America and Mexico."

113th Street, North Seminole, FL. The meetings provide a venue to share knowledge and keep updated on the latest in the world of malacology. Throughout the year the club sponsors field trips, picnics, and an annual dinner. The club newsletter *Tidelines* is published quarterly and is available online. For more information: www.stpeteshellclub.org.

October 2010 British Shell Collectors' Club Shell Show



The British Shell Collectors' Club was founded in 1972 and held its first exhibition in 1976. The 2010 show was a rousing success with lots of great shells in both scientific and artistic displays. A listing of award winners includes:

One Species

1st Koen Fraussen: *Neobuccinum eatoni* (won Peter Oliver Cup)

2nd Kevin Brown: *Trachycardium isocardia*

One Genus/Family

1st Mick Davies: British Buccinidae (won the Scotia Shield)
British

1st Graham Saunders: "Nomad Gene Pool"

2nd Dave Rolfe: "Variation in the Common Limpet"
Foreign

2nd Graham Saunders: "Signature Species"
Self-Made Shell Art

1st Selina Wilkins: Shell Flowers (won the COA award)

2nd Lucy Pitts/Loretta Spridgeon: Shell Montages
Shell Photography (member ballot)

1st Paul Wilkins: *Ensis americanus*

2nd Sara Cannizzaro: "Shellfish"
Shellomania

1st Dave Rolfe: "A Mystery"

2nd Carl and Craig Ruscoe: "Back to Front Shells" (included Walter Karo Award winning sinistral *Trichia hispida*)

3rd Angela Marsland: Self-collected Florida Fossils
Junior: age 12 - 16

1st Theo Tamblyn: Unionid mussels (won John Fisher Trophy)

Junior: 11 & under

1st Christopher Wilkins: Moving Molluscs
Dealer Shell of the Day (member ballot)

1st Fernand de Donder & Rika Goethaelts: *Nodipecten magnificus*
Shell of the Show

1st Carl & Craig Ruscoe: sinistral *Trichia hispida* (Linnaeus, 1758)



British Shell Collectors' Club President Derek Howlett presents the COA Award to Selina Wilkins for her shell art exhibit titled "Shell Flowers."



Above: Carl Ruscoe holds the Walter Karo Award for Shell of the Show, a sinistral *Trochulus hispidus* (Linnaeus, 1758) the hairy helicellid. This small land snail (7.9mm) was collected in flood debris by the River Ribble, at Samlesbury, near Preston, Lancashire, England, by Carl and Craig Ruscoe. Often listed as *Trichia hispida*, a junior generic homonym that was disallowed by the ICBN (see H. Lee comments and an image of this shell at: <http://www.jaxshells.org/dr29s.htm>

Left: These shell montages by Lucy Pitts and Loretta Spridgeon took second place in the 'Self-Made Shell Art' category.



Oregon Society of Conchologists Shell Show



The Oregon Society of Conchologists Shell Show was held 26-30 April 2011 in the main viewing area of the Oregon Museum of Science and Industry in Portland. Total attendance at the museum over these

dates was 17,168 and estimates by museum staff are that at least 90% visited the shell exhibit. John Mellott was show chair, and it was a most successful shell show. The COA Award was won by Judy Barrick with an exhibit titled "Latiaxis Shells." Judy had 35 species of Coralliphilinae on display in six feet of cabinets. She also took "Best Single Shell" of the show with a specimen of *Babelomurex yumimaruimai* Kosuge, 1985. Other major awards were: the DuPont Award to Jonathan Reid for his exhibit "Cowries of the World," and the Jean McCluskey Award (most educational display) to Judy Barrick (she really had quite a display) for "Latiaxis Shells." The Oregon Society of Conchologists is a non-profit organization founded in 1965. Monthly meetings are held at various localities throughout northwestern Oregon. Membership is over 70 and varies from beginners to professionals. Club President is Joyce Matthys; information at: www.oregonshellclub.com.



Judy Barrick wins the COA Award with "Latiaxis Shells." Her display featured 35 species of these often intricately sculptured shells, now considered a subfamily of Muricidae.



What is a shell worth?

Hi Tom,

As editor, for many years (23 editions), of *A Catalog of Dealers' Prices for Shells*, I have often been asked, "What is the highest price ever paid for a single shell?" I have never been able to feel confident in a reply to this question, however, I have reliable information that a Bangkok collector recently (December 2010) paid \$45,000 (U.S.) for a sinistral specimen of *Turbinella pyrum* (Linnaeus, 1758).

I also heard of an offer of 30,000 Euros (made this year) for a specimen of a very rare Cypraeidae, *Nesiocyprea alexhuberti* Lorenz & Hubert, 2000 (now placed in the genus *Austrasiatica*). The offer was apparently rejected by the owner of the specimen.

Tom Rice

Rawai Beach, Phuket, Thailand



Three *Turbinella pyrum* or sacred chank shells that have been intricately carved for possible use in religious ceremonies (image courtesy of Wikipedia.com). These are common right-handed or dextral specimens and are not nearly as rare as left-handed or sinistral specimens. The sacred chank was discussed by Jesse Todd in his article "Conch shells on coins," *American Conchologist*, vol. 39, no. 1 (March 2011). For more information about a rare sinistral specimen, see Harry Lee's article "Historical notes on a sinistral sacred chank: *Turbinella pyrum*," in this issue.

Historical notes on a sinistral sacred chank: *Turbinella pyrum*

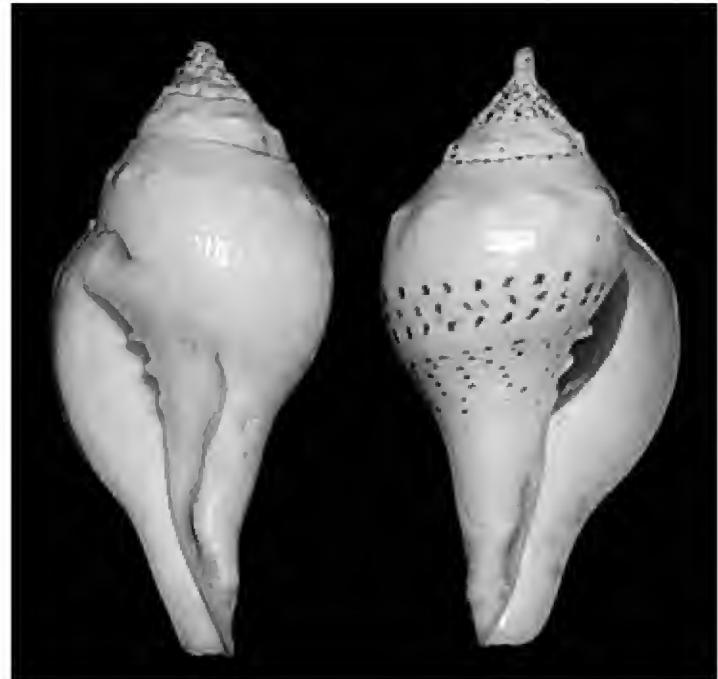
Harry G. Lee

I have had the sinistral sacred chank, *Turbinella pyrum* (Linnaeus, 1758) shown here (with a normal dextral specimen, details at: <http://www.jaxshells.org/pyrum1t.htm> and <http://www.jaxshells.org/reverse.htm>) since 1986. It was a gift and, with all my shells, will be in the Florida Museum of Natural History (FLMNH) within 20 years.

It was probably collected before the twentieth century - possibly by one of the Calverts. Its ownership passed from the Calvert Collection through a concatenation of deals to Maxwell Smith (1888-1961), thence to the University of Alabama, and ultimately the FLMNH. To better understand its history I dug up what I could about the specimen's itinerary on this side of the puddle from the UK, where it had languished for about four decades (Cooper,* pers. comm. Sept. 19, 2002).

My friend, Tony D'Attilio (1909-1997) actively worked with the collection from its landfall in N.Y.C. in 1938 (*teste Cooper*) or 1939 (D'Attilio, 1950). He described a collection of almost incredible proportions (300 large cases; one of which contained 3,000 specimens of *Conus*), and indicated that Ehrman [Martin Ehrmann (1904-1972 *teste Cooper*)] failed in his attempts to sell the entire collection - including a tender to the city of Baltimore (the Lord of that name was an ancestor of a succession of the collection's owners; see below) [this "offer" was one of Calvert's many lies *teste Cooper*]. Considering the extent, historical, scientific, and plain old conchological value *vis a vis* the price Ehrmann paid (about \$20,000.00 *fide* Dance, 1986: 173, 207 [\$8,000 *teste Cooper*], even the inflation of the U.S. dollar fails to explain this disconnect.

Anyway, sales of small lots and individual shells continued well into 1940, when Hugh K. Milliken bought the remainder (the vast majority of what Ehrman started with, apparently). I have a manuscript (2 pp. double-spaced 8.5 X 11 in. typescript; undated, but probably 1940 or 1941) "info-mercial" over Milliken's by-line which states the collection was begun, "...in the middle of the seventeenth century by Lady Ann Arundel, wife of Cecilius Calvert, second Lord Baltimore, first governor of Maryland..... Although the collection was handed down from father to son for generations it was not until it came into the possession of John Calvert [1825-1897 *teste Cooper*], the great grandson of the sixth and last Lord Baltimore [John Calvert's noble lineage was probably sheer fantasy *teste Cooper*] that it reached its present great importance... he was the first to discover gold in New South Wales and in New Zealand... He explored New Guinea, the Indian Archipelago [?] and many of the Pacific islands.... On all these travels he took ad-



The very rare left-handed or sinistral sacred chank (left) and the more common right-handed or dextral form. Specimens of *Turbinella pyrum* can be found in many shell collections worldwide, but as only 1 in 600,000 are sinistral, the number of sinistral specimens in collections is only a handful (estimated at three in the U.S.). Both of the shells in this photograph are in the collection of Harry Lee. Image courtesy of Jacksonville Shell Club Website: www.jaxshells.org (Bill Frank webmaster).

vantage of every opportunity to increase his collection of shells... The minerals and gems have been sold separately; the small but interesting fossil collection and the million or more shells from every country in the world are now being unpacked little by little so that they may be more carefully classified and arranged."

Tony worked with Milliken (at 115 East 94th St.) until 1942, with continued desultory sales (including some to the U. S. National Museum). Shortly afterward Milliken fell ill and the collection was transferred to the home of Milliken's brother in Old Lyme [of Lyme Disease fame], Connecticut. Later Heathcote Woolsey bought the collection and Tony again took measure of it; that's as much as he wrote in 1950.

* Michael Cooper (1946-2008), then Registrar at the Nottingham Free Museum [UK] (pers. comm., Sept. 16 and 19, 2002 [Conch-L] <<http://www.listserv.uga.edu/cgi-bin/wa?A2=ind0209c&L=conch-l&F=&S=&P=543>>; <<http://www.listserv.uga.edu/cgi-bin/wa?A2=ind0209c&L=conch-l&F=&S=&P=4206>>), indicated he was working on a biography of John Calvert, who apparently led a "scurrilous life" including being a prodigious liar and huckster. Cooper disputes the accuracy of some of the information above, and I have indicated all inconsistencies. This Calvert biography appears not to have been published at the time of this writing (May 2011).

How and when Maxwell Smith obtained his Calvert material is unknown to me, but labels (possibly other archival materials) in the FLMNH may hold some clues. Smith's collection went to the University of Alabama, which institution was so grateful it rewarded its benefactor with a D. Sci. (Abbott, 1973)! Regrettably the university later felt it was unable to maintain the collection and it was ceded to the FLMNH in the mid-1980's and placed in Fred G. Thompson's stewardship.

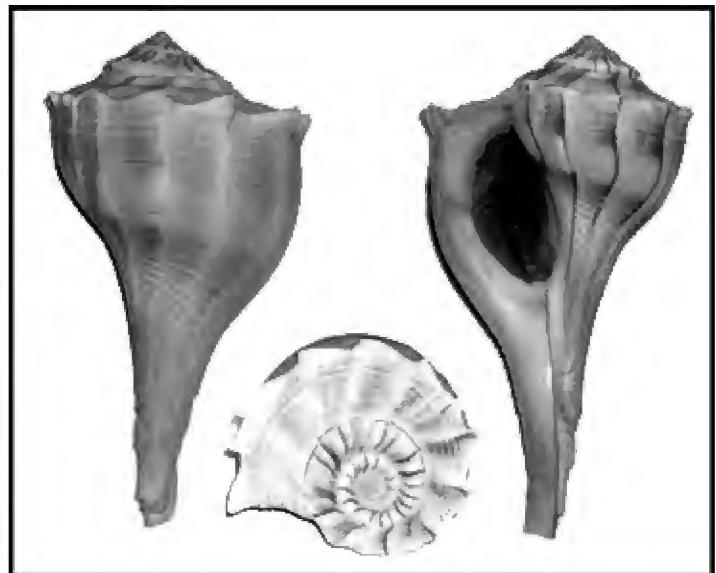


Hindu priest blowing a “trumpet” made out of a large chank shell - *Turbinella pyrum*. Shells used in this manner are often intricately carved and heavily decorated with brass and silver. Image from Wikipedia.com.

There is a long and well-studied relationship between Hindu scripture (and folklore) related to *Turbinella pyrum* and, in particular, the sinistral mutant. This unique chapter in “ethnoconchology” is nicely summarized by Rose (1974). It is written that Vishnu, or one of his avatars, hid sacred liturgical scrolls inside a sinistral chank. While there are great numbers of shell collectors (and postage stamp printers) who cannot distinguish a sinistral from a dextral snail shell, a good Hindu knows the difference! A consequence of this unusual familiarity and affinity is a demand for ownership which amplifies the market value beyond Western conchological benchmarks. Thus, there are probably hundreds of these specimens in Indian households and, to the best of my knowledge, only three in American shell collections!

Beyond the scriptural chronicle above, I believe that the often-trivialized act of (a human) decanting the liquid contents of a sinistral shell (seldom available in *T. pyrum*; characteristic in *Busycon perversum sinistrum* Hollister, 1958) using his **right** hand (vs. the opposite set-up) reinforces the virtue of the sinistral chank and may be intertwined with the scriptural and liturgical Hinduism. This simple act is ceremonial in many religions and implications of right and left hand usage are even more widely appreciated, conspicuously in India. Demand for *B. perversum* shells in that country is astoundingly high vs. the conchological value we Westerners attach to this common species.

Rarely do we get a numerical handle on the frequency of reversal of gastropod coil, but owing to the economic importance of the chank fishery in southern India, the British Colonial Government kept scrupulous records. It turned out that only 1 shell in 600,000 was left-handed (Hornell, 1916). Compare that with 1:283 (*Busycotypus canaliculatus* embryos: Lee, <<http://www.jaxshells.com>>), 1:440 (*Prunum apicinum*: Lee, 1979), 1:760 (*Hyalina philippinarum*: Coover and Lee, 1989), and ~1:100,000 (*Cerion* species: Lee, 2011).



The common lightning whelk, *Busycon perversum sinistrum*, found along the eastern coast of the United States and throughout the northern Caribbean. Larger specimens of this typically sinistral shell are often completely white and sometimes sold in India for high prices. Image courtesy of Wikipedia.com.

org/canalsin.htm>), 1:440 (*Prunum apicinum*: Lee, 1979), 1:760 (*Hyalina philippinarum*: Coover and Lee, 1989), and ~1:100,000 (*Cerion* species: Lee, 2011).

The infrequency of sinistral sacred chanks alone warrants a certain status in the pantheon of rare natural history objects, but the added mystique may be what is needed to make this the most sought after of all shells.

Priceless, however, is holding such an object, however temporarily, and knowing it has a chain of ownership reaching back to at least Victorian Era (ig)Nobility and reflecting on the assortment of characters who shepherded it to its ultimate repose, intended to be the FLMNH.

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Hornell, J. 1916. The Indian varieties and races of the genus *Turbinella*. *Memoirs of the Indian Museum*. 6:109-125, 3 pls.

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Harry G. Lee - shells@hglee.com



SCUM XV: Southern California Unified Malacologists

Lindsey T. Groves



Standing (l to r): Lindsey Groves, Ananda Ranasinghe, Scott Rugh, James Jacob, James McLean, Kelvin Barwick, Ángel Valdés, Shawn Weidrick, Bill Tatham, Jessica Goodhart, Rich Nye, Dieta Hanson, Bob Dees, John Ljubenkov, Jillian Walker, Don Cadien.

Kneeling (l to r): Joanne Linnenbrink, Zoe Allen, Lance Gilbertson, Jackson Lam, Pat LaFollette, Bob Moore.

Present at SCUM XV but not in photo: James Preston Allen, Doug Eernisse, Suzanne Matsumiya. (Image by Doug Eernisse with the author's camera)

The 15th annual gathering of Southern California Unified Malacologists (SCUM) was held at the headquarters of the Southern California Coastal Water Research Project (SCCWRP), Costa Mesa, CA. Twenty-five professional, amateur, and student malacologists and paleontologists attended the event on Saturday, March 5th, 2011. An unanticipated local power outage at scheduling time forced a later than usual gathering this year. This informal group continues to meet on an annual basis to facilitate contact and keep members informed of research activities and opportunities. In keeping these gatherings informal, there are no dues, officers, or publications. It is hoped that the continuing success of informal groups such as SCUM, Bay Area Malacologists (BAM), Mid-Atlantic Malacologists (MAM), Ohio Valley Unified Malacologists (OVUM), and FUM (Florida Unified Malacologists) will encourage more regional groups of malacologists and paleontologists to meet in a likewise manner.

SCUM XV host Kelvin Barwick welcomed the group and in SCUM tradition all present were given the opportunity to introduce themselves and give a short update about current mollusk related activities and interests. Most presentations were informal but several were more detailed. John Ljubenkov presented an interesting program on hydroids that attach to mollusk shells,

many of which are deep water species (ie., *Halitholus cirratus* on the deep water bivalve *Acila castrensis*). Most hydroids seem to prefer attachment to dead mollusk shells rather than living shells. Jessica Goodhart, Jillian Walker, Jackson Lam, and Dieta Hanson, who work with Ángel Valdés at Cal Poly Pomona, made presentations on their research. As always, in addition to his busy teaching schedule, Doug Eernisse (Calif. St. Univ. Fullerton) updated everyone on his extensive research projects with his colleagues and grad students. Pat LaFollette presented an update on pyramidellid literature acquisitions via internet resources. Scott Rugh presented research on comparisons of modern environments to those of the late Pliocene San Diego Formation environments. Numerous discussions and comments resulted from these presentations. SCUM XVI will be hosted by John Ljubenkov at the Cabrillo Marine Aquarium, San Pedro, CA, in January of 2012.

SCUM XV participants and their respective interests and/or activities:

James Preston Allen (San Pedro, CA): Attending SCUM XV with daughter Zoe Allen and publisher of *Random Lengths*, an independent newspaper in San Pedro, CA.

Zoe Allen: High school student and volunteer at the Cabrillo Marine Aquarium, San Pedro, CA.

Kelvin Barwick (Orange Co. Sanitation District): Continues research on mollusk and polychaete faunas of the Southern California Bight and current Treasurer of the Western Society of Malacologists.

Don Cadien (L.A. Co. Sanitation District): Currently researching environmental biology of bathyal and abyssal invertebrates of southern California.

Bob Dees (San Diego Shell Club): Former President of Orange Coast College but continues to collect shells and is current Vice-President of the SDSC.

Doug Eernisse (Calif. St. Univ. Fullerton): In addition to teaching duties Doug has a myriad of research projects with professional and grad student colleagues including: Phylogenetics and affinities of *Fissurella volcano*; *Ostrea* phylogeny and phylogeography in the Gulf of California; new species of brooding chitons from Santa Catalina Id., California Channel Islands; DNA bar-coding of Indonesian chitons; research on new species of the sea star genus *Henricia*; and shield limpet habitat analysis.

Lance Gilbertson (Newport Beach, CA): Research Associate at the Nat. His. Mus. L.A. Co. continues with research on terrestrial mollusks of the southwest.

Jessica Goodhart (Cal. Poly. Pomona): Researching life cycle and development of *Haminoea vesicula* and comparison to the invasive species *H. japonica* in California.

Lindsey Groves (Nat. Hist. Mus L.A. Co.): Continues as Collection Manager at NHMLAC. Has recently published a paper with descriptions of 11 new cypraeid species from the Cantaure Formation of northern Venezuela and has a paper in press on new cypraeoideans from the Paleogene of Washington, California, and Baja California Sur, Mexico.

Dieta Hanson (Cal. Poly. Pomona): Researching *Haminoea japonica* and its affects on the native cephalaspidean species in San Francisco Bay and its phylogeny.

James Jacobs (College of Borrego, Borrego Springs, CA): Interested in fossil faunas of the area.

Pat LaFollette (Nat. Hist. Mus. L.A. Co.): Continues rearranging the Pyramidellidae in the NHMLAC malacology collection and continues to acquire pertinent pyramidellid literature via the internet. More recently has collected numerous micro-gastropods from Miocene deposits in the San Gregorio Pass area, Riverside County, many of which may be undescribed species.

Jackson Lam (Cal. Poly. Pomona): Researching deep-sea *Armina* nudibranchs many from expeditions to New Caledonia by the Paris Museum, particularly their reproductive systems, jaws, and radulae. Presented a short video exhibiting a strange feeding behavior in *Armina*.

Joanne Linnenbrink (Cal. St. Univ., Long Beach): Currently an undergraduate student preparing to attend Calif. St. Univ., Fullerton, and work with Doug Eernisse.

John Ljubenkov (Pauma Valley, CA): Self proclaimed “industrial taxonomist.” Currently studying hydroids that grow on living and dead mollusk shells in deep and shallow water.

James McLean (Nat. Hist. Mus. L.A. Co.): Jim continues work on his eagerly anticipated volumes on North Pacific shelled gastropods. His monograph of worldwide Liottiidae is nearly complete.

Suzanne Matsumiya (San Pedro, CA): Attending SCUM XV with daughter Zoe Allen.

Bob Moore (Nat. Hist. Mus. L.A. Co.): Volunteer at NHMLAC and avid shell collector who is currently curating material collected by urator Emeritus James McLean in South Africa.

Rick Nye (Calif. St. Univ., Fullerton): Researching the limpet *Lottia scabra* and its distribution in northern California versus that in southern California, particularly near Pt. Conception, Santa Barbara County, a natural faunal barrier.

Ananda Ranasinghe (SCCWRP): Because he volunteered to allow access to the meeting facility on a day off, Ananda was made an honorary SCUM member.

Scott Rugh (Escondido, CA): Currently doing contract work with the US Geological Survey making a comparison of modern offshore faunas to those of the late Pliocene San Diego Formation.

Bill Tatham (Pacific Conchological Club): First-time SCUM attendee with an interest in Conidae.

Ángel Valdés (Cal. Poly. Pomona): Teaches Evolutionary Biology and continues phylogenetic research on opisthobranch gastropods of the Caribbean and Panamic provinces.

Jillian Walker (Cal. Poly. Pomona): Researching *Aplysia* in southern California and its reproductive strategies.

Shawn Wiedrick (Pacific Conchological Club): Current President of the PCC and interested in all areas of shell collecting. Volunteers at the Nat. Hist. Mus. of L.A. Co. identifying micro-turrids of the Indo-Pacific.

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Interesting boring

He Jing



Fig. 1 A bivalve shell with a bored hole.

Introduction

I often recall the days when I started shell collecting, over two decades ago. One of the scenes that often plays back in my memory is the first time I picked up a bivalve shell on the seashore and found a hole on it. My curiosity drove me to find its cause. Fortunately there was an easy answer; the hole is left after a predator drilled into the shell. The boring differs a lot from the smaller pinholes caused by an octopus or the chipping caused by fish and crabs. The hole bored into a shell is a regular circle. It is neat and beveled, with chamfered edges.

After I started working as a professional shell dealer I had the chance to visually inspect and handle a great number of unsorted shells. I began setting aside shells with boring marks and quickly had a great many such shells. I thought other collectors might be interested, as many collectors do not get to examine shells before a dealer has sorted them and culled the "unsightly"

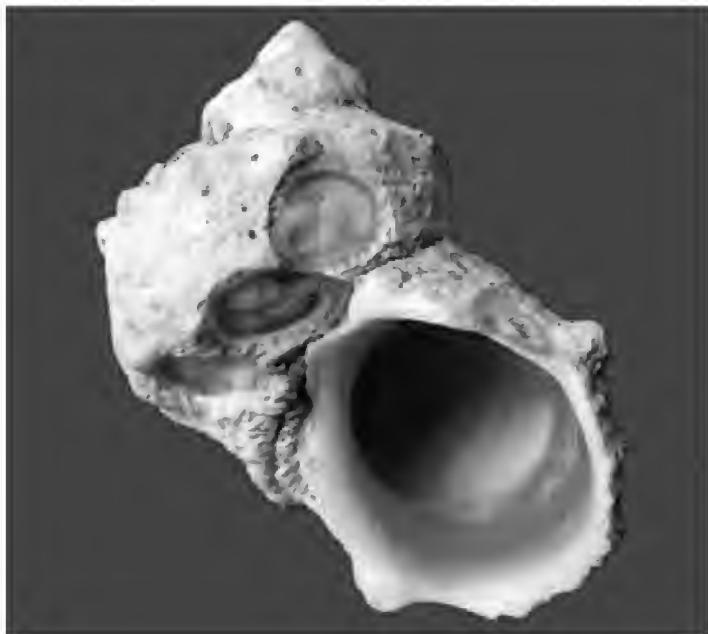


Fig. 2 A *Turbo chrysostomus* showing several boring attempts.

specimens. I am unable to present any scientific conclusion in this short article, but I hope to offer some interesting examples of shells that have suffered boring attacks.

Struggle for life

When I observe shells with indications of boring, they seem to provide a capsule documentary that vividly presents the brutal struggle for survival by our colorful creatures of the sea. Many shells have incomplete borings and many have multiple borings. I found a cone with four borings, none of them completed.



Fig. 3 A cone with four borings.

Why so many borings in a single shell? Apparently the cone was doing its best to escape while at the same time the predator refused to give up easily. The repeated attacking and defense resulted in the multi-borings.

Is there any chance that more than one predator drilled in the same time? I believe the answer is yes. I had an olive specimen that had two completed holes bored into the shell. If these were bored by the same predator, why would it drill the second hole after succeeding with the first? One assumption could be that the olive escaped just after the predator completed the first hole, leaving it no time to enjoy the result of its labor. The predator then had to do it again. This assumption leads to another question. If both borings were from the same attacker, why not search out and use the finished hole for the second attack - unless it was placed incorrectly. Or the predator may not remember where it drilled for

its first attempt. It is certain that no conclusion can be reached by just looking at the end result on a shell - as interesting as it might be.

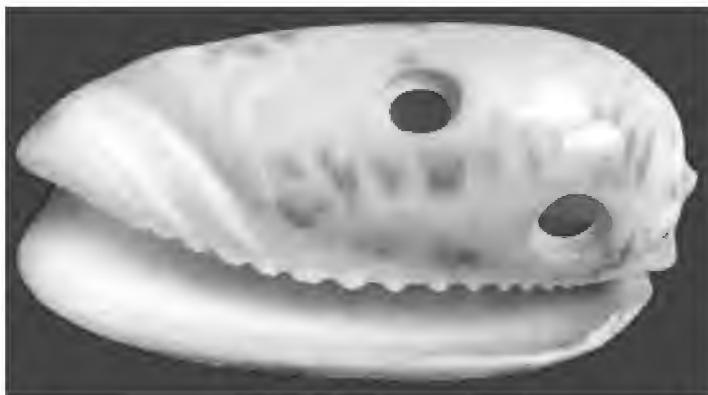


Fig.4 An olive specimen with 2 completed borings.

Nevertheless, the specimens I have gathered clearly show that life in the sea is tough. The drilled shells either lose their lives or fight tenaciously and live with scars. As for the predators, they certainly do not seem assured of victory with each attack.

How to drill?

A number of books discuss the mechanics involved in drilling into a shell. First, the predator gets control of the prey, then secretes a variety of chemicals called carbonic anhydrases. The drilling lasts a few hours to several days. I have not done a study of the chemicals involved or the duration of the boring process. From the specimens I have collected, however, it seems that the predator does not always have a good control of its intended prey. Some of the prey are quite large in comparison to smaller predators. It would seem there is no control by the predator in such situations, but rather a smaller *Murex* or *Natica* just "hangs on" while boring through the victim's shell. Another interesting phenomenon is the position of the boring. It seems the position is not decided by the predator, instead, it is more likely determined by the shape of the prey's shell.

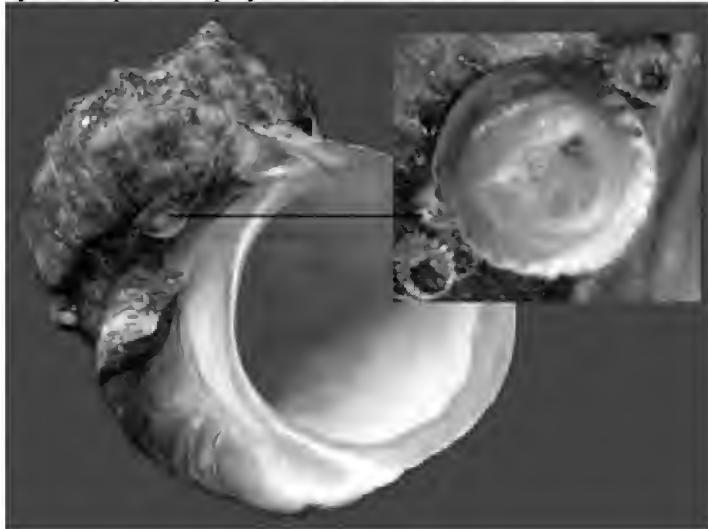


Fig 5 a A large turban specimens with borings. Note the serrations around the perimeter of the boring.

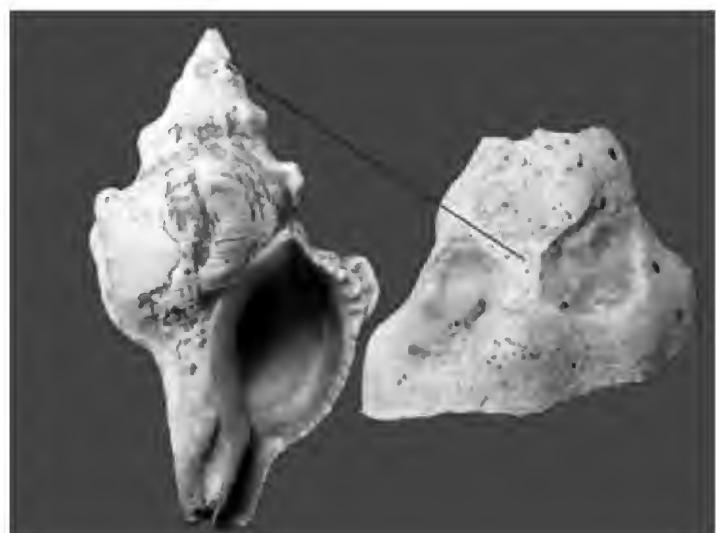


Fig 5 b A large fasciolarid specimen with borings on the spire.

The drilling position among certain prey species is almost identical. This may indicate a vulnerable spot on the shell or just the most available area for an attack.



Fig. 6 A group of olives showing that in all but one case, the same point of attack was used.



Fig.7 A group of turbans with drill attempts.

The boring position of gastropod shells is typically just behind the aperture on the ventral surface of the shell, about one whorl in from the outer lip. This position is probably where the animal inside the shell is accessible and thus vulnerable. A hole drilled on the dorsal surface would likely find an empty shell as the inhabitant can withdraw deeper into the shell. This ventral drilling position is quite close to the aperture of the victim, indicating

little threat from the prey animal (biting or other self-defense actions). In contrast, I found that bivalve shells are usually attacked and drilled at the rear portion of the shell near the hinge, but even this is variable and the images I have provided show borings into bivalve shells in many different areas.



Fig.8 Borings near the hinge on bivalves.



Fig.9 Borings on the thick spire section of strombids.

Not all drill holes are found in the same area of a given species. Architectonicid shells seem to be attacked on both the dorsal (most often) and ventral surfaces. It looks like the predator may not know where it should attack. The illustrated example (Fig. 12) shows a shell with the drill hole in the apex.

The thickness of the shell area portion does not seem to be a deterrent to drilling as predators seem to focus more on the accessibility of the prey's flesh after the shell is bored open. This may explain why cones and strombs frequently show boreholes at the thickened shoulder area.

I have a murex specimen which is densely covered by barnacles (Balanidae). Apparently the barnacles around the boring position were cleared by the predator to enable it to have enough room to start its bore hole. I have no idea how the predator cleared the barnacles or why it prepared such a spacious site, an area seemingly much larger than needed to bore into the shell.

With shells like turban shells with their thick shells and opercula, it is quite understandable that attackers dominate them by drilling. They seem well protected against others avenues of attack. Yet many victims with bore holes have thin shells, seemingly

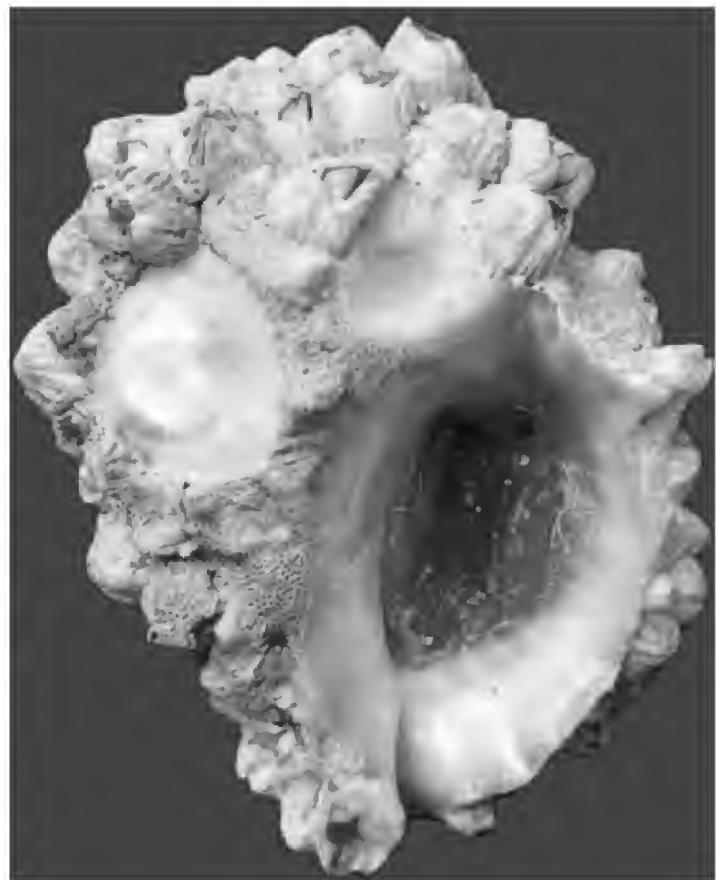


Fig.10 A boring worksite amidst barnacles on a murex.

easily broken. They are drilled into in much the same way as their thicker-shelled neighbors.

Some tiny shells also show signs of being bored into, maybe indicating even smaller attackers.



Fig.11 Micro shells (size between 1mm to 4mm) also show signs of boring attacks.

Boring attacks also happen in the deep sea. I have collected many shells from the East China Sea at 100+ meters with indications of boring attacks.

Most literature lists muricids and naticids as predators, but in fact they are often victims and often show evidence of boring attacks. I have collected many other shells with evidence of boring attacks, but have yet to find a specimen of cephalopod



Fig.12 Borings on various specimens from deep water.

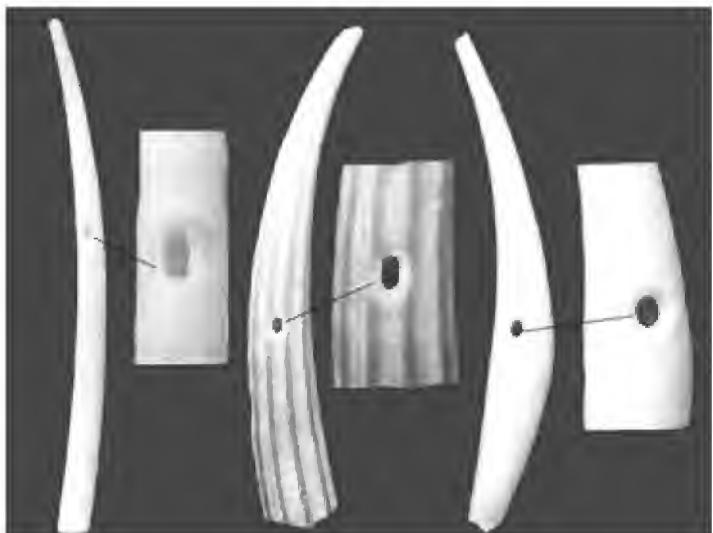


Fig. 15 Borings on Scaphopoda shells.



Fig.13 Naticidae shells with borings.



Fig. 16 Borings at Bivalvia shells

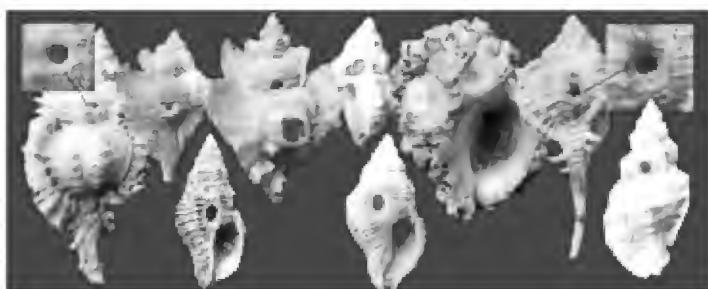


Fig.14 Muricidae shells with borings.

or chiton with evidence of bore-holes. It is certain that gastropods, bivalves, and scaphopods are vulnerable.

The thing that puzzles me most is that I have never found a single cowrie with a bore-hole. I have handled thousands of *Cypraea miliaris* and *Cypraea hungerfordi*, and inspected them one

by one. In 2007 during my journey to Hainan Island I asked workers of a shellcraft workshop to check a batch of *Cypraea moneta*, the weight of which approached one ton. None was found with any evidence of a boring attack. I also asked fishermen to collect cowries with bore holes for me, but what eventually turned up were small pinholes, not borings. My search will continue.

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www.shellsfromchina.com



Fig.17 Various gastropods with evidence of boring attacks.

Mattheus Marinus Schepman (1847-1919)

and His Contributions to Malacology

by A.N. Van Der Bijl, R.G. Moolenbeek, and J. Gould

2010, Netherlands Malacological Society, Leiden, 200 pages, ISBN 978-90-815230-11, \$50 at anvdbijl@xs4all.nl

As early as the 1500s, shell collectors in the Netherlands were at the vanguard of a growing interest in natural history fueled by the wonders brought back from expeditions around the world. Dutch interest in conchology continues today, as evidenced by shell publications and the Nederlandse Malacologische Vereniging [Netherlands Malacological Society]. This society was begun in 1934 and in celebration of its 75th anniversary, a special book was published in honor of and about Mattheus Marinus Schepman, one of, if not the most, important shell collectors of his country and certainly one of the top collectors in Europe. M. Schepman combined the fascination and wonder of shells as objects of natural history with a scientific approach that made his collection of great value to the entire malacological community. Schepman amassed an extensive shell collection by self-collecting, trade, and purchase. More importantly, he was selected by M.W.C. Weber, Director of the Zoölogisch Museum Amsterdam (ZMA), to identify and describe the malacological specimens collected during the Siboga Expedition (1899-1900). This expedition collected flora and fauna samples from 322 sites among islands in the Indo-Malaysian Archipelago. Mollusks from a previous similar expedition had been identified by K.E. Von Martens, who probably recommended Schepman for the work on the second expedition. From 1908 to 1913, Schepman published descriptions in seven volumes of some 1,235 species of shelled mollusk, many new to science. All totaled, he identified over 2,500 mollusk specimens. This work established Schepman's credentials as a conchologist. He continued to aggressively build his private collection and after his death the Schepman collection was purchased in 1920 by the Zoölogisch Museum Amsterdam (University of Amsterdam, Amsterdam, the Netherlands). For f6,205, the museum obtained a collection of shelled marine, freshwater, and land mollusks totaling approximately 9,000 species in 1250 genera. Also included were 10 large oak cabinets and an extensive library.

This present work provides a quick review of Schepman's life, and then adds texture, color, and interest, by including: transcripts and images of letters to and from dealers and other well-known shell collectors, images of his collection and data slips, images of his contemporary malacologists, and a complete bibliography (he wrote over 60 malacological publications). This is followed by a lengthy section on "New Taxa Introduced by Mattheus Marinus Schepman." Here the authors have provided de-



scriptions and superbly detailed illustrations (many published for the first time) of some 450 taxa introduced by Schepman. When there is no illustration, it is because the described specimen is from the Siboga Expedition, and all 32 plates from this expedition are included in a later chapter. Thus every taxon is illustrated. Just having available this treasure trove of type illustrations is of great value, but the authors have gone further by listing type localities and by providing a detailed analysis of questionable type status. The authors also provide a listing of taxa named after Schepman, taxa he named after other persons (including etymologies), and separate listings of the Schepman taxa sorted alphabetically by family (and then species), by genus (and then species), and by complete name (family, genus, species, subspecies).

This is a well-researched, well-written, and richly illustrated addition to conchological literature. It is not intended for the casual shell collector, but it provides a needed window into an important part of conchological (or malacological) history as well as a needed reference tool. For anyone who aspires to a more detailed knowledge of shelled mollusks, this book is a most welcome addition.

Tom Eichhorst
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Compendium of Florida Fossil Shells Volume 1

Middle Miocene to Late Pleistocene Marine Gastropods

by Edward J. Petuch & Mardie Drolshagen

2011, MdM Publishing, Wellington, FL, DVD in slim plastic "jewel case" - \$19.95 from Mal de Mer Books, MDMSHELLBOOKS.COM

This is an intriguing concept of a DVD combined with a hard copy book version to be published at a later date. There are pluses and minus to both media, so hopefully this combination will allow readers to benefit from the pluses of each. This is a planned series of six volumes on fossil shells of Florida by Edward J. Petuch and Mardie Drolshagen, who earlier combined their talents on "Molluscan Paleontology of the Chesapeake Miocene." Dr. Edward Petuch of Florida Atlantic University provides the fossil expertise while Mardie Drolshagen of Black Diamond Photography provides meticulous and detailed photographs of the taxa being discussed as well as some interesting Florida scenery.

The planned six volumes are divided by 'stratigraphic importance,' with volumes one to four covering the more important (stratigraphically characteristic) and abundant marine gastropod fossils, while the last two volumes cover marine and freshwater gastropod fossils more rarely encountered as well as bivalve fossils. Over the course of the planned publications, more than 400 gastropod and bivalve genera will be described and illustrated. This includes more than 300 new species and 20 new genera.

Florida has become rather well known for its rich fossil assemblages with over 1,500 molluscan fossil species (over 5mm in length) having been discovered to date. The 1994 publication of the "Atlas of Florida Fossils Shells" by Edward Petuch has been somewhat overcome by the discovery of hundreds of new species. The planned six volume publication should do much to resolve this issue. This first volume reviews seven gastropod families: Strombidae, Cypraeidae, Ovulidae, Eocypraeidae, Triviidae, Conidae, and Conilithidae. Also provided in some detail is a review of Florida geology with discussions of regional stratigraphic formations, coastal paleoceanography, and the paleoecology of Neogene Southern Florida.

The "book" (I have not yet seen the hard copy version, but I assume it will be substantially the same as the DVD version) begins with a short general history of fossil collecting in southern Florida and then covers specific collecting areas. Many of these areas are now closed to public collecting, but interested fossil hunters can often work through local shell clubs to obtain access. While I am not personally familiar with these names, I am sure many fossil hunters in COA will recognize names such as: Mule Pen Quarry, Brantley and Cochran Pits, Rucks Pit, Griffin Brothers Pit, etc. Each is analyzed for its fossil origins, richness, diversity, and originating geological formation. This introduction to the collecting areas of southern Florida is followed by a listing of the 119 new species named in this volume. These and an additional 172



related species are all illustrated in volume 1.

All of the above is introduction. Chapter one is a detailed coverage of the "Geologic Framework of Southern Florida," including specific details about some dozen major Florida geologic formations. This is followed in chapter two by a step back in time to the now long-gone Okeechobean Sea, the Paleocene formation that is now the Everglades. Most recognize the defining nature of Florida's Everglades, but here is a fascinating journey back to the Eocene to review the geology of the area and how it came to provide such a rich molluscan environment during the Paleocene. All of this, from the introduction onward is accompanied by photographs that bring additional life to the text.

The remaining chapters are dedicated, one or two families per chapter (grouped by genus), to the molluscan families covered in this volume. Each species is thoroughly described, illustrated, and details provided as to type measurements, location, stratigraphic range, and name etymology. The species descriptions end with a general discussion where additional details are provided, such as comparisons to similar species. Almost all of the photographs are black and white, but considering the lack of color in most fossils and the added sharpness of a B&W photograph, this is certainly not a detracting aspect.

Now back to the nature of such a publication on DVD. A thorough index is provided, but it can still take some time scrolling to the page desired. Here a book would be much handier. On the other hand, the images can be enlarged to show an incredible amount of detail. Because of this, I believe amateur collectors interested in Florida fossils as well as professionals will undoubtedly want both hard copy and electronic versions. Those unsure of their interest in this area can purchase the DVD for the relatively inexpensive price of \$19.95. If the DVD suits your needs, then you are done (until the next volume). If you decide you would also like the hard copy (there is something after all inherently "right" about a book - at least to those of us born in the previous century), the purchase of the DVD includes a coupon that entitles you to a discount off the book price (\$89.95), dropping the price to \$60. I do not know if this will be true for later volumes.

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Shells of the Hawaiian Islands

Vol. 1, The Sea Shells; Vol. 2, The Land Shells

by Mike Severns

2011, Conchbooks, Hackenheim, Germany, pp. 564, pl. 225 (sea shells) & pp. 460, pl. 186, 363 maps (land shells), ISBN 978-3-939767-35-0, for both volumes in slip case: ISBN 978-3-939767-33-0; Vol. 1 approx., \$297, Vol. 2 approx., \$235, both vol. in slip case, approx., \$431.



Allison Kay published "Hawaiian Marine Shells" in 1979 and listed 966 valid species of shelled marine mollusks in Hawaii. A lot has happened since then. The present work by Mike Severns lists 1,333 valid species of shelled mollusks in the islands and as Philippe Bouchet states in the introduction to Severn's work (p. 31), "...there is still a long way to go to a 'complete' inventory of Hawaiian marine molluscs." In the meantime, we have a superbly written and lavishly illustrated work that is much more than an update on Kay's work. The color plates are 8.5 x 11.5 inches, which means many of the shells are illustrated at much greater than life size. An 11mm specimen of *Triphora earlei* Kay, 1979, is shown at better than 100mm! A 4mm specimen of the Hawaiian endemic *Smaragdia bryanae* (Pilsbry, 1917) is shown at 55mm. These are sharp, definitive images with details of sculpture and protoconch, as well as subtleties of color pattern evident as never before. Species from streams, shallow intertidal waters, coral reef habitats, and deep water are all represented with the name, size, a quick comment about where the specimen was collected, and a crystal clear color image. Vol. 1 also includes an introduction to the Hawaiian biota by Philippe Bouchet. He discusses endemism and the difficulty of any mollusk arriving at and settling in Hawaii.

Vol. 2 completes this marvelous set with more details about the development of the Hawaiian Islands and a history of land snail collecting and research on the islands (by Bernhard Hausdorf). Recorded land snail species climbed steadily from the initial descriptions by Captain Cook and Captain Dixon in the early 1800s to a known 750 species (most endemic) by the late 1940s. Sadly more than 75% of the land snail species on Hawaii are now extinct. The causes are many and fairly well-known (e.g. habitat destruction and introduction of alien species), but that does not bring back any of those lost species. Interestingly, the author almost accomplished this feat. The land snail genus *Partulina* was thought by many authorities to have become extinct on Hawaii. Our author proved that not only was it not extinct, but that there were a number of thriving populations on the different islands. It was literally a case of endless searches through thick rain forest, only to find the quarry in the tree under which he had been parking his jeep. Since then he has spent several decades documenting this genus and other rare land snails in Hawaii. Another interesting aspect of Hawaiian land snails: of the voucher specimens in island museums, perhaps 20% are as yet undescribed!

With both volumes, Mike Severns contacted authorities around the world to ensure his data were correct and up-to-date.

For example, the Cypraeidae section was reviewed and comments provided by Felix Lorenz; Mitridae by Richard Salisbury, Muricidae by Roland Houart, etc. Our knowledge of the molluscan world is growing daily, with hundreds of new species named each year and new research methods providing a better insight into the status of different species. Because of his meticulous preparation and research, as well as illustrations second to none, these books are well worth the price. Yes, they are a bit expensive, but once in hand you will realize that the excellence of the work drove the price and that no better references can be found for Hawaiian Island sea and land snails.

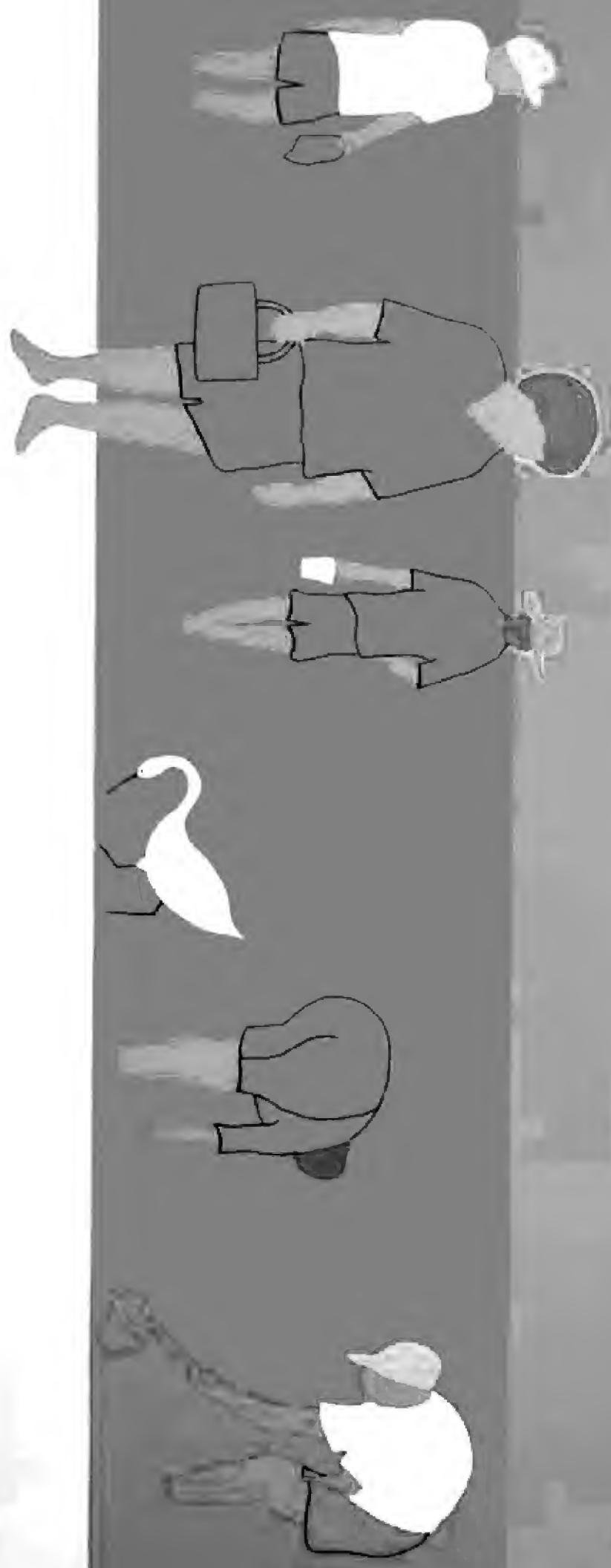
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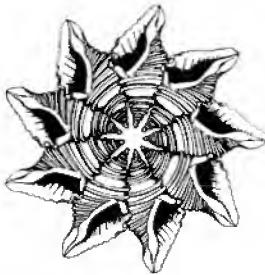
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CONCHOLOGIST



Quarterly Journal of the Conchologists of America, Inc.

CONCHOLOGISTS OF AMERICA, INC.



In 1972, a group of shell collectors saw the need for a national organization devoted to the interests of shell collectors; to the beauty of shells, to their scientific aspects, and to the collecting and preservation of mollusks. This was the start of COA. Our membership includes novices, advanced collectors, scientists, and shell dealers from around the world. In 1995, COA adopted a conservation resolution: Whereas there are an estimated 100,000 species of living mollusks, many of great economic, ecological, and cultural importance to humans and whereas habitat destruction and commercial fisheries have had serious effects on mollusk populations worldwide, and whereas modern conchology continues the tradition of amateur naturalists exploring and documenting the natural world, be it resolved that the Conchologists of America endorses responsible scientific collecting as a means of monitoring the status of mollusk species and populations and promoting informed decision making in regulatory processes intended to safeguard mollusks and their habitats.

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Front Cover: *Angaria sphaerula* (Kiener, 1839), approximately 60mm+, from the Philippines. This magnificent shell was one of several displayed at the Cape Canaveral COA Convention by Donald Dan. This color variety has been called ‘sunburst’ by dealers and is both uncommon and beautiful. There were many other notable rarities at this year’s bourse; it was truly an exciting event. Make plans now to attend next year at Philadelphia. Photo by Tom Eichhorst.

Back Cover: *Chicoreus spectrum* (Reeve, 1846) collected and photographed by Bill Kreis. This is one of the spectacular shells collected during a recent expedition to the Dominican Republic. See Karen VanderVen’s story on page 26.

Editor’s comments: Robert Robertson wrote to clarify some of the mystery presented in the He Jing piece (Interesting Boring) in the June issue. Dr. Robertson states that many of the bore holes were actually “... muricid and naticid drill holes with the resting sites, often with central hummocks, of *Sabia* (hipponicid limpets). This issue is missing two planned book reviews. I try to present articles in pretty much the order I receive them, but this time I was faced with articles that had already been delayed too long. The book reviews will appear next issue.

One of the books due for review is “**Living Shells**” by Charles Rawlings (ISBN13: 978-1-57197-509-6), priced at approximately \$32 to \$38 on Amazon.com (also from Ivy House Publishing Group, phone- 919-782-0281). Readers of this magazine will recognize the name, Charles Rawlings, as a frequent contributor of superbly detailed, high quality photographs of mollusks from around the world. These are not scenes of under-sea life you will see elsewhere.

Another book that will be reviewed in the next issue is “**Seashell Poems and Reflections to Soothe the Soul**” by Bev Bethell Dolezal (ISBN 978-1-4507-6482-7), priced at \$15 from <http://www.bahamabevs.com>. This gem has 12 original poems, each accompanied by a sea-related image. This small book (25 pages) celebrates in poetry the author’s love of the sea and of seashells.

Then there are the books I picked up at the convention, each deserving of a review so our readers know what is out there for dedicated shellers. Still to be reviewed are:

“**Compendium of Bivalves**” by Markus Huber (ISBN 978-3-939767-28-2) with 901 pages of facts and full-color illustrations of 3,300 bivalves!

“**Fossil and Recent Muricidae of the World**” by Didier Merle, Bernard Garrigues, & Jean-Pierre Pointier (ISBN 978-3-939767-32-9) with 648 pages of color and black & white images of more than 650 species of Muricidae.

“**Philippine Marine Mollusks,**” vols. I-IV by Guido T. Poppe (ISBN vols. 1-4: 978-3-939767-19-0) with 2,947 pages of color images of Philippine mollusks.

Finally, a correction on “**Shells of the Hawaiian Islands**” by Mike Severns, reviewed in the June 2011 issue. I inadvertently listed incorrect ISBN numbers and, more importantly, incorrect prices for this superb two-book set.

“**The Land Shells**” (ISBN 978-3-939767-34-3): 98 Euros (\$139 US, not \$235, so \$96 or 41% less), plus postage to the US of 16 Euros = \$23 (total \$162).

“**The Sea Shells**” (ISBN 978-3-939767-35-0): 128 Euros (\$182 US, not \$297, so \$115 or 39% less) plus postage to the US of 20 Euros = \$28 (total \$210).

Both volumes in slip case (ISBN 978-3-939767-33-6): 190 Euros (\$270 US, not \$431, so \$161 or 37% less) plus postage to the US of 36 Euros = \$51 (total \$321). This set of books is well worth the higher price I mistakenly listed, so it is a steal at \$321!

Tom Eichhorst

Noteworthy mollusks from the Gulf of Mexico, including new record sizes and geographical extensions

Emilio F. García

The offshore benthos of the Gulf of Mexico continues to surprise us with unexpected discoveries. These discoveries may represent “forms” that might be undescribed species, extended geographical distributions, sizes larger than previously reported, or species, even genera, that have been only recently described. Examples of all of the above are presented here. All but one were collected during different campaigns on the R/V *Pelican*, either with a box core sampler that is simply dropped to the bottom to grab sediment, a regular 3 x 2 x 1 ft. dredge for hard substrates, or the Benthic Skimmer, a rather large dredge especially designed to work in the soft-mud conditions of deep water (see García, 2007). The specimens were collected between 60 and 1,745 meters deep, in an area approximately that shown on the map at right (from latitude 27°35'N to 29°20'N, and from longitude 88°15'W to 93°18'W). For a complete list (other than Polyplacophora and Cephalopoda), as well as for many images of molluscan species found in offshore waters of Louisiana, refer to García & Lee (2011)*. Mr. Bill Frank, the webmaster of JAXSHELLS has done a superb job bringing these images to the public. Most of the material for this study is based upon work supported by the RAPID grant from the National Science Foundation.

PLATE I

(Figures 1-5, page 5)

***Atrina cf. seminuda* (Lamarck, 1819)** (Fig. 1). The 250 mm specimen pictured in the plate was collected using the Benthic Skimmer. It was dredged off the Mississippi river delta in 334-250 m, an unusually deep habitat for an *Atrina*. The single specimen differs in external sculpture from *A. seminuda*; because of the “tremendous range of variation” (Turner & Rosewater, 1958:318) of this species, however, the definitive identification for this deepwater population may have to be established by additional specimens and anatomical work. Darryl Felder, my colleague at the university whose guest on the *Pelican* I have been on many occasions, tells me that he has seen specimens nearly 24 inches long, and so has Douglas N. Shelton, with the Alabama Malacological Research Center.

***Neopycnodonte cochlear* (Poli, 1795)** (Fig. 2). The genus *Neopycnodonte* is placed in the family Gryphaeidae, also called “foam oysters,” and lives at greater depths than any other Recent oyster (Mikkesen, and Bieler, 2008: 118). The specimen illustrated



was attached to the *Atrina cf. seminuda* treated above. It is the first time this species has been reported from the Gulf of Mexico, other than the Florida Keys (Turgeon et al., 2009). This specimen measures 46.8 mm.

***Jorgenia luteophyla* Taylor & Glover, 2009** (Fig. 3). This recently described lucinid species has been assigned to the newly erected genus *Jorgenia* Taylor and Glover, 2009. The new genus differs from the similar genus *Lucinoma* in lacking the prominent commarginal lamellae of the latter and in having small cardinal teeth (Taylor & Glover, 2009:133). There are also other differences. The specimen pictured is a paratype and was dredged by the Benthic Skimmer off Louisiana in 850- 610 m.

***Jorgenia louisiana* Taylor & Glover, 2009** (Fig. 4). Also assigned to the recently erected genus *Jorgenia*, this species was collected at “Bush Hill,” a site of hydrocarbon cold seeps that occur off the Louisiana coast in 540-555 m. An image of *Jorgenia louisiana* has previously appeared in *American Conchologist* as a “*Lucinoma*” sp. (García, 2003:28, fig. 7). The specimen figured is a paratype.

“*Myrteopsis*” *lens* (Verrill & Smith, 1880) (Fig. 5). Another deepwater lucinid not reported from the Gulf of Mexico, other than the Florida Keys (Turgeon et al., 2009). The specimen in the plate was dredged off Louisiana in 334-250 m. A previous lot, also from off Louisiana, was dredged in 450 m (EFG 13649) and a third lot off Tampa, Florida, in 308-323 m (EFG 25330).

*The listing and images of mollusk species referred to here, “Report on molluscan species found in the offshore waters of Louisiana, including many extensions of known range and un-named species,” (www.jaxshells.org/efg1030.htm) includes a listing of 577 species found in these waters! This was possible in large part because of two factors: the availability, starting in 1993, of the research vessel *Pelican* from the Louisiana Universities Marine Consortium, and the long-term dedication of many individuals.

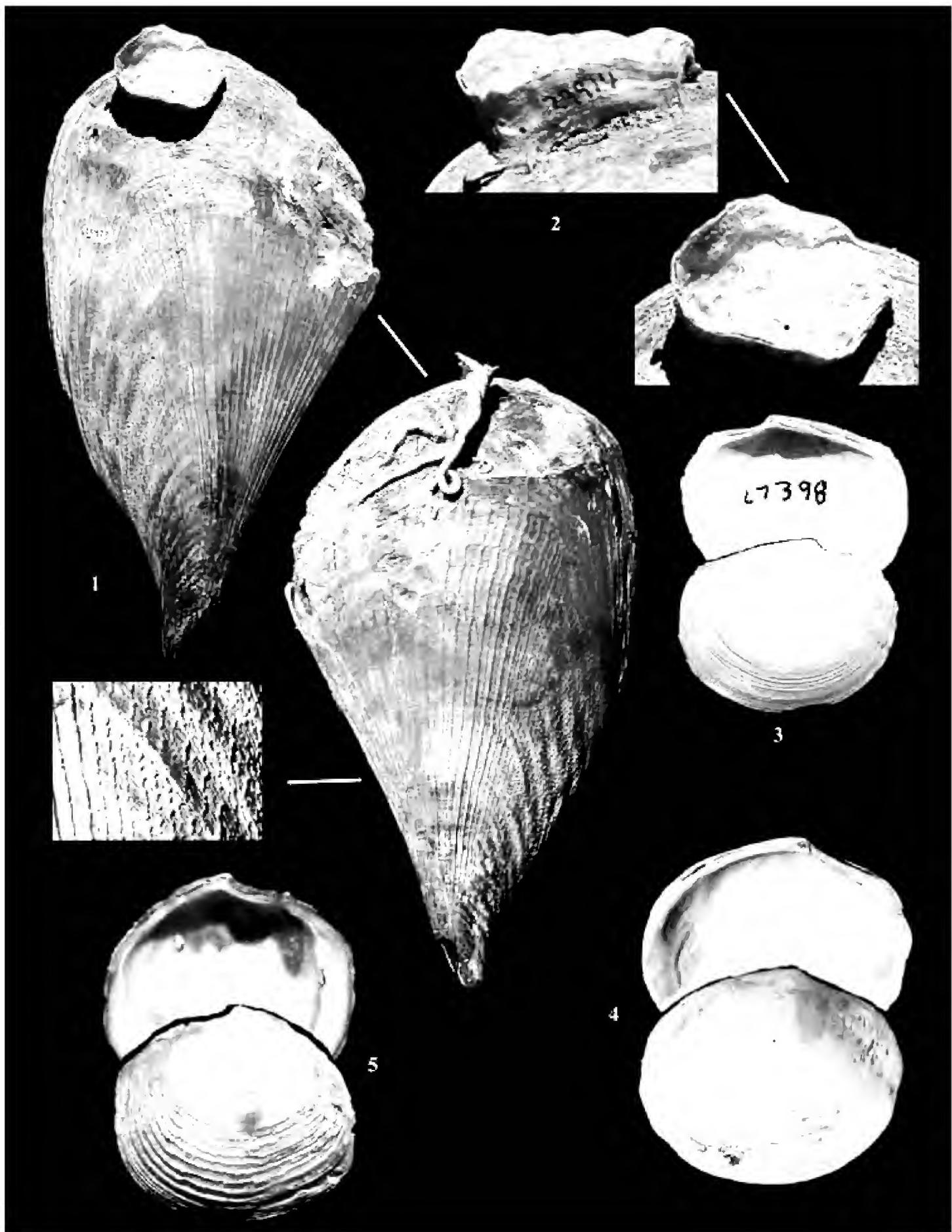


PLATE II

(Figures 6-14, page 7)

Glossocardia agassizii (Dall, 1886) (Fig. 6). Although this species had already been reported from Louisiana (Odé, 1964-2001), it is included here because of its rarity. The specimen photographed measures only 24.3 mm, but a second specimen from the same lot, not as well-preserved, measures 31.6 mm (EFG 30008). The maximum reported size was 27 mm (Rosenberg, 2009). *Glossocardia* has been placed in the family Trapezidae.

Graptacme perlonga (Dall, 1881) (Fig. 7). One of the most elegant of the tusk shells, this species can grow to 90 mm. It was reported by Dall (1881: 36) as having been collected in the Yucatan Strait in 640 fathoms; otherwise, it had not been reported from elsewhere in the Gulf of Mexico. The figured specimen was collected alive with a box core sampler off Vermilion Parish, Louisiana, in 400 m, and measures 58.3 mm.

Calcarovula piragua (Dall, 1889) (Fig. 8). A specimen of this very rare species, formerly placed in *Phenacovolva*, was first dredged in 2005 off the Louisiana coast. A photo of the live animal appeared in Lorenz & Fehse (2009: 602, fig. A272) where it was erroneously stated that the specimen was dredged off the Florida coast. The specimen figured here was recently dredged off Alabama on a hard substrate. It was photographed in an aquarium on a piece of gorgonian that came up in the same dredge haul. It is assumed that the specimen was living on that particular species, as no other gorgonian was present. *Calcarovula piragua* has now been collected alive in the northern Gulf from 28°02.51'N, 92°26.88'W, in 60-74 m, to 29°26.37'N, 87°34.3'W, in 76-80 m.

Pseudosimnia vanhyningi (M. Smith, 1940) (Fig. 9). This rare species has also been reported by García & Lee (2003). A single eroded specimen was collected in 1994 off Alabama in 122 m (EFG 14563) and another in 1996 off Louisiana, in 66 m (see Lorenz & Fehse, 2009: 192, figs. 3 and 4). Two rather fresh specimens were recently obtained in the same haul off Mobile Bay, Alabama, in rubble. Smith originally described *P. vanhyningi* as having a “surface covered with interrupted regularly spaced spiral lines” (1954:46), a character that is not shown even in these fresh specimens; also, the holotype is more rotund in appearance (see Lorenz & Fehse, 2009: 192, fig. 1).

Polinices leptaleus (Watson, 1881) (Fig. 10). When I retrieved the single live specimen of *P. leptaleus* from the Benthic Skimmer it was a “wow” moment. I immediately took it to the aquarium, hoping for a photo of the animal, but it was not to be. I had never seen this species before, but knowing it was a *Polinices* that lived at great depths helped me begin my search. Accessing the ever-helpful *Malacolog* lead me to Watson’s taxon and, with the help of Harry Lee, I managed to download an 1886 report, also by Watson, where the author figured and re-described the species (pp. 441-442, pl. xxvii, fig. 7). *Polinices leptaleus* had not been recorded from the Gulf of Mexico, other than the Florida and Yucatan Straits, and its maximum size had been reported as 8.9 mm (Rosenberg, 2009). The specimen pictured measures 14.5 mm.

Ranella olearius (Linnaeus, 1758) (Fig. 11). *Ranella olearius* was originally described from the Mediterranean; however, besides other eastern Atlantic localities, it has also been reported from the southern Indian Ocean and New Zealand. With this geographical distribution it is not surprising that the species has crossed the Atlantic and has been recorded from Uruguay and Brazil, to northern South America, the Lesser Antilles, and Bermuda (Henning & Hemmen, 1993; Rosenberg, 2009). Bermuda seems to be the nearest locality to the Gulf of Mexico recorded.

Mr. Frank Frumar, of Kirkwood, Missouri, sent me a specimen of *R. olearius* collected (“crabbed”) in a Golden Crab trap set in the Florida Straits in 685 m. It was brought to him by Bill Whipple, captain of the F/V *Falcon*. When he first obtained the specimen several years ago, Frank brought it to Kevan Sunderland, of Sunrise, Florida, who was the first to properly identify it. The juvenile specimen measures 72.2 mm and is the only record of the species for the Gulf of Mexico.

(P.S. The unfortunate news is that when I sent the specimen back to Frank, via certified mail, it was lost by USPS, notwithstanding the fact that his address and my return address were correct, and that the package had a “tracking” number which ultimately meant absolutely nothing. In spite of numerous phone calls and trips to the post office by Frank and myself, the parcel remains “lost”).

Epitonium krebsii (Mörch, 1875) (Fig. 12). This species is rather uncommon. Even though it has previously been recorded from Louisiana (García & Lee, 2002: 11), it is included here because the recorded maximum size for this species is 19 mm (Rosenberg, 2009), but the specimen pictured in the plate measures a breathtaking 27.7 mm. And no, the costae are not scalloped, only chipped.

Cosmioconcha rikae K. & D. Monsecour, 2006 (Fig. 13). Dead specimens of *C. rikae* are not uncommonly dredged off the Louisiana-Mississippi-Alabama coast. I have 15 lots in the collection from such dredgings. What is interesting about this lot is that the specimens were unusually large and colorful; the largest, collected empty, measured 17.6 mm. The largest specimen reported before was 14.2 mm (Rosenberg, 2009). Other than size and color, differentiating characters between this population and typical specimens were not detected. The animal has a siphonal canal patterned with pale tan elongated oval blotches surrounded by brownish specks.

Vexillum articulatum (Reeve, 1845) (Fig. 14). This extraordinary specimen, both in color and size, had to be placed in context with other specimens collected in the Gulf of Mexico and elsewhere so that an appropriate identification could be reached. See “On *Vexillum* (*Pusia*) *articulatum* (Reeve, 1845) and *V. (P.) trophonium* (Dall, 1889),” that follows this article.

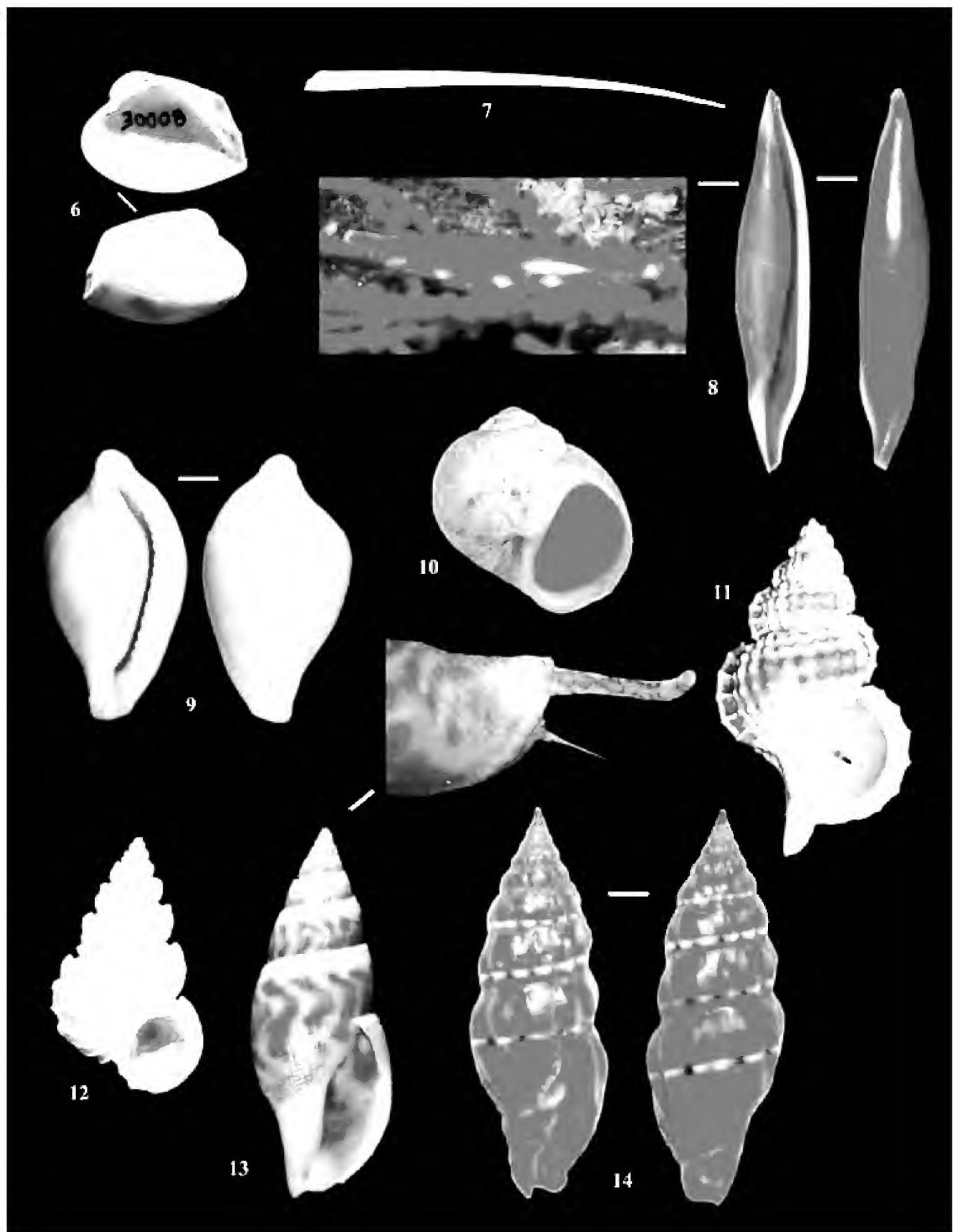


PLATE III

(Figures 15-20, page 9)

***Volutomitra bairdii* (Dall, 1889)** (Fig. 15). A very eroded empty shell of the “typical” form of this rare species was collected off Louisiana in 2003 by means of a box core sampler in 640-680 m. On a cruise made some years later, two smaller specimens with a pink central band were dredged alive at the same general depth (García, 2007, figs. 9, 10). As I had not read of *V. bairdii* with pink bands I catalogued them as *V. cf. bairdii*, but on a rather recent cruise, using the Benthic Skimmer, we dredged a number of live specimens that intergraded from specimens having a band that was almost brown in color (see fig. 15, right), to a very pale pink band, to the typical white shell. This color band seems to show only on sub-adult specimens, although white sub-adults were also found. The maximum reported size for the species is 35 mm (Rosenberg, 2009), but one of our specimens is 39.4 mm. The animal is white.

***Gymnobela agassizii* (Verrill and Smith, 1880)** (Fig. 16). This species has been previously reported from the northwestern Gulf of Mexico (Pequegnat, 1963), but it is included here because of its rarity. The species was collected alive just east of the Mississippi river delta, in 1,350 m. The animal is white.

***Gemmula periscelida* (Dall, 1889)** (Fig. 17). Although this beautiful turrid was collected by the *Pelican* in Bahía de Campeche in 2005 and reported from off Alabama and Texas by other expeditions, this is the first time that the *Pelican* has collected it in the northern Gulf. The animal is white and rather active. Older specimens are covered with a black stain, as is often the case with deepwater shells.

***Pleurotomella pandionis* (A. E. Verrill, 1880)** (Fig. 18). This interesting turrid was originally reported by Verrill as living off the Massachusetts coast, and more than a century later it was reported as inhabiting the Gulf of Mexico (Davenport, 2000). As no images accompanied Davenport’s article, the identification was questioned (Rosenberg, 2009). Three lots representing this species have been collected off Louisiana, at a depth between 1267 and 1350 m, confirming Davenport’s report.

***Scaphander punctostriatus* (Mighels & Adams, 1842)** (Fig. 19). A deepwater species, the animal is too large to retract into the shell. The white animal is designed to “plow” through the soft mud where it lives. It moved at a very slow pace when it was placed in the aquarium.

***Scaphander watsoni* Dall, 1881** (Fig. 20). Also very slow-moving, the animal is very similar to the preceding species, but both the animal and the shell are more elongate. The outer yellowish coloring is in the very thin epidermis; the darker orange is stain.

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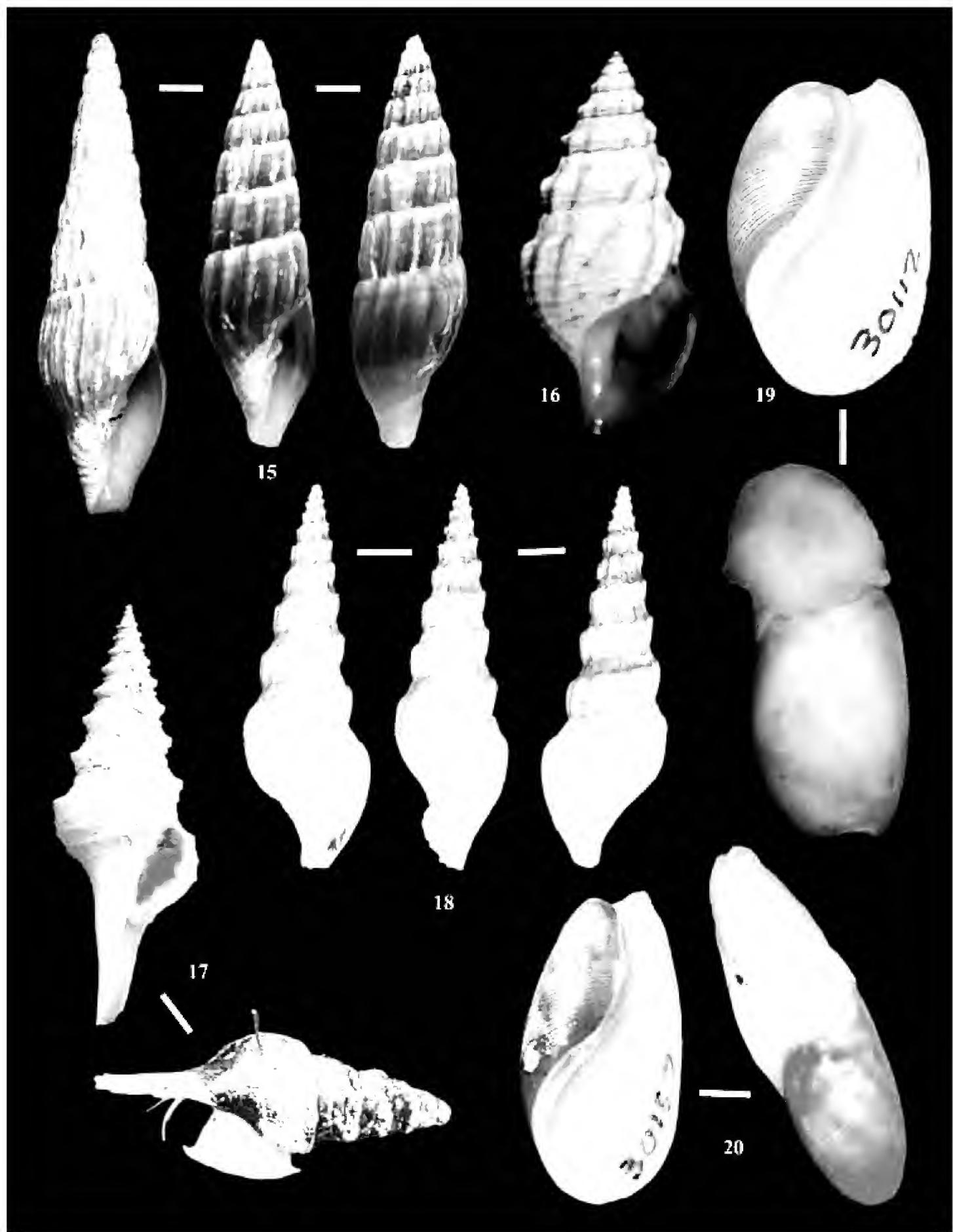
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On *Vexillum (Pusia) articulatum* (Reeve, 1845) and *V. (P.) trophonium* (Dall, 1889)

Emilio F. García

While trying to elucidate the identity of the *Vexillum* illustrated in the preceding article on the Gulf of Mexico (fig. 14), I contacted Richard Salisbury, who provided photos of specimens and of type species, and Harry G. Lee (HGL), who sent species in his collection that might be assigned to the *Vellum articulatum/histrio* complex. Harry and Richard also sent important literature that was of great help to this project. It was fortunate that Harry had one lot of multiple specimens from the Bahamas, collected alive by James Jacaruso, that I presume to be referable to *Vexillum articulatum* (Reeve, 1845) (see figs. 9-10), and I have in my collection (EFG) one lot of multiple specimens of *V. histrio* (Reeve, 1844) from the west end of Roatán Island, Honduras (see figs. 3-5). I also have in my collection three lots from southwest Florida and two lots from Louisiana, that I presume to be *Vexillum articulatum*. Many other specimens and photos of specimens were examined. In the adjoining plate I used the most pertinent specimens to illustrate what I consider to be variations on two distinct taxa, *Vexillum histrio* and *V. articulatum*.

When I first began this project I encountered problems often found when dealing with old taxa: the description was vague, of barely five lines, with only color pattern to go by; there was no holotype, or geographical distribution, and the outline of the figure did not quite resemble any western Atlantic species. All I had was a color pattern that very much resembled some forms of other western Atlantic *Vexillum*, particularly *V. histrio*.

Because of the problems listed above, I considered Reeve's taxon to be a *nomem dubium*; there was so little to go by. Then Richard Salisbury sent me a photo of a specimen from the collection of the late Andy Adams dredged off Boynton Beach, Florida (fig. 7), that Richard had labeled "Vexillum articulatum" and which, indeed, was very similar to Reeve's figure. So I decided to begin my investigation from scratch.

Inspecting the western Atlantic *Vexillum* taxa in Cernohorsky (1978) led me to a close scrutiny of a seldom-cited taxon that seems to have flown under the radar for many years, *Vexillum trophonium* (Dall, 1889). Dall's description of the unusual protoconch of *V. trophonium* states: "Stilifer-like nucleus of five or more whorls, acute, yellowish-brown, polished, glassy" (p. 161). This is a very accurate description of the protoconch of several juvenile specimens I had dredged in the Gulf of Mexico (see fig. 12), together with several adults. One of the juveniles was dredged off Louisiana (see <http://www.jaxshells.org/arrest.htm>) [this image also appeared in Garcia (2008: 7; fig. 19)] sympatrically with my problematic 22.4 mm specimen shown in fig. 14 of the previous article. Moreover, Dall's holotype shows a profile that compares favorably with the Boynton Beach specimen and the 22.4 mm Louisiana specimens. I have seen photos of similar specimens from the Al Deynzer collection; but those specimens are no longer in his possession (Al Deynzer, pers. com.). The holotype of *Mitra trophonia* (fig. 8) does not show the color markings of these two specimens, however, Dall's description states: "color from pale yellow to deep orange, with a narrow opaque white band... and may in some specimens be represented by a series of spots on the crests." [my bold letters] (p. 161)

The juvenile specimens studied are either solid orange in color (fig. 12) or have a light-yellow peripheral band. As the number of whorls increases, dark blotches begin to appear in the intercostal spaces, either at the anterior edge of the peripheral band

or at its center. Some specimens, however, lack a peripheral band (fig. 10), while others may have the dark spots at both the anterior and posterior edges. Figure 11 shows a specimen where the dark spots do not begin to show until the end of the 5th whorl. I consider the color pattern of the band to be one of the least reliable of the characters for the species.

Vexillum articulatum is most similar to *V. histrio*, from which it differs by having a proportionately narrower shell with less conspicuous, wider, less numerous axial costae (compare figs. 1-5 with figs. 7-11). Unfortunately, I have not been able to locate a *Vexillum histrio* with an intact protoconch. Redfern's image of the protoconch of *V. histrio* (2001, pl. 53, fig. 489A) is probably not of that species as his figure 489B of an adult *V. "histrio"* represents another species. Redfern's figure 489A has the characters of *V. articulatum* as treated in this study, a species that has been found in the Bahamas (Figs. 9-10). Redfern has confirmed this similarity (pers. com.).

Specimens of *V. articulatum* with dark spots at the anterior edge of the interspaces are similar to the marking of *Vexillum cubanum* Aguayo & Rehder, 1936 [= *V. areustum* Rehder, 1943]. Cernohorsky (1978: 92) considered the two taxa to be possible synonyms; however, the needle-like protoconch of about 5 whorls of *V. articulatum* is very different from that of *V. cubanum* as drawn by Kaicher (1977: 1440) or that of *V. areustum* as described by Rehder (1943: 201). *Vexillum cubanum* does not attain the large size of *V. articulatum*.

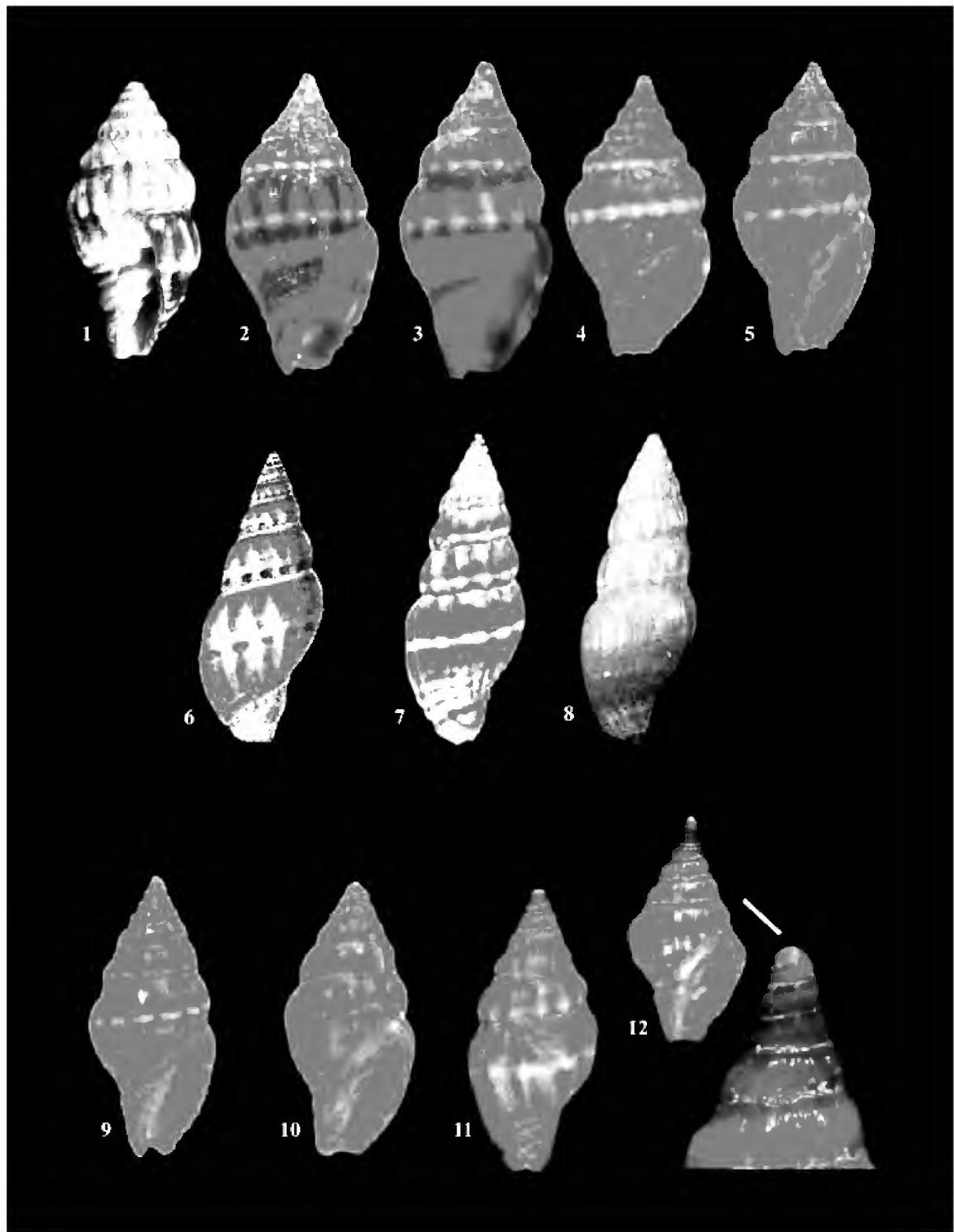
Since there is no type material or locality data for Reeve's *V. articulatum*, the only concrete evidence is his colored figure. One may presume, as Cernohorsky (1978) has, that another species of western Atlantic *Vexillum* may be referable to Reeve's taxon, but most of the solid evidence points to *Vexillum trophonium* (Dall, 1889).

My thanks to Richard Salisbury, Harry Lee, Colin Redfern and Al Deynzer for their collaboration.

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Epilogue/prologue to “junkyard bug” report with two early references

Harry G. Lee

In a recent report (Eichhorst, 2010: 25), the larva of the lacewing (Arthropoda: Insecta: Neuroptera: Chrysopidae), also known as an aphis-lion, was reported as “The world’s smallest and (probably ugliest) shell collector.” The article was based on a discovery by active COA member David Kirsh, whose memorable photographs of this gnarly “junkyard bug” illuminated the story.

Mention was made of an earlier documented discovery of this sort by Dan Dourson (2006), who enumerated six species of land snails from a similar larva found in the Great Smoky Mountains National Park, not too far from David’s discovery in Rockingham Co., NC. Dan’s report was brought to the attention of the Conch-L list-serve subscribers by Dr. Tim Pearce (pers. comm., 22 April 2010 < <http://www.listserv.uga.edu/cgi-bin/wa?A2=ind1004D&L=conch-l&P=R95> >).

A third observation of this lacewing larva découpage, apparently previously unpublished, was made by one of Dan’s colleagues, Dr. Ron Caldwell (Dourson, pers. comm, 25 April 2010).

On 27 October 1928 David T. Jones of Marietta College in southeastern Ohio, while searching for snails in leaf litter on a wooded hillside in nearby Vinton Co., came across such a snail-laden larva (Jones, 1929). With the assistance of two colleagues, he gathered four more specimens likewise adorned. Back in the laboratory, eight individual shells of probably four species were found stuck to the most prolific collector. In reference to five of these shells, identified as *Punctum “pygmaeum,”** he marveled at the little collector’s resourcefulness as he himself had found only one shell in the vicinity after a 15 minute search! Jones also remarked that he had seen such an association in Squaw Hollow, not far from campus. Regrettably, that particular Aphis-Lion larva evaded capture.

Sometimes it seems like “...there’s nothing new under the sun.” (Anon., ca. 250 BCE: 1: 10).

Anon., ca. 250 BCE. *Ecclesiastes 1:9.* New International Version, 12 chapters, 222 verses, 1973.

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Above: The original image provided by David Kirsh of his “junkyard” bug (green lacewing larva or aphis-lion) with its collection of juvenile *Glyphyalinia wheatleyi* (Bland, 1883).
Below: A better look at the “junkyard” shell collector by Dan Dourson of Bakersville, North Carolina.



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* a frequent misidentification of *P. minutissimum* (I. Lea, 1841) in those days. That fact notwithstanding, *P. pygmaeum* (Draparnaud, 1801) has recently been discovered in the USA for the first time (Lee, 2010: 6-7).

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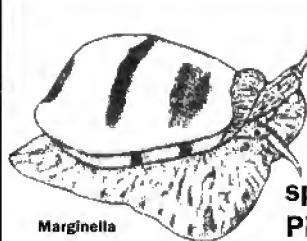


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Romancing the Stones: a shelling expedition to the Dominican Republic

Karen VanderVen

Nag, nag, nag. How much can a man take? For years Glenn Duffy's ardent shelling fans on various trips had heard his stories of living for years in the Dominican Republic and the shells to be found there. They begged him to organize a trip. Finally, participants in a tour to Venezuela last year convinced him and he announced a tour scheduled for July 2010. Filling up quickly with a contingent from Florida's Englewood Shell Club, the expedition involved 18 shellers* who flew to Santo Domingo in mid-July. There we were met by Glenn and his old friend Randy Hooks, who would help guide the expedition. A three-hour scenic bus ride brought us to our hotel in Salinas, on the southeast coast of the Dominican Republic. The picturesque hotel was nestled on a beautiful cobalt bay surrounded by mountains. Our prime shelling spot was just minutes away.

Glenn had primed us ahead of time with the names of the signature shells of the area and we each constructed our personal collecting agenda accordingly. On our lists? The famous *Xenophora conchyliophora*, the Atlantic carrier shell, was at the top. These aren't just *any* carrier shells. Only from this area of the world do they come with *stones* attached around the characteristic concentric whorls. Then of course, there was *Strombus gallus*, the rooster-tail conch. Other treasures, such as *Turritella exoleta*, *Conus daucus* and *Oliva jamaicensis*, were very much anticipated.

Early the next day, to catch a morning minus tide, we burst onto the long coastal beach area that we would shell at different spots the rest of the trip. There were four types of habitat available, thus accommodating the predilections of every sheller (and the residence of many mollusks): 1) the tide lines up and down the beach; 2) in the water, acres of turtle grass; 3) on-shore and off-shore reefs; and 4) shallow water sand patches or pits. Interestingly, some shells were found in areas where one would usually not expect to find them, e.g. a species typically found in *Thalassia* grass beds would be spotted in bare sand or a sand-dweller would be found in the grass beds. "There's nothing to it but to get to it," Bill Kreis would say during the trip, and we had no trouble doing so each and every day.

Splendor in the Grass

The first day our main intent was to find the stone-studded carrier shells (*Xenophora conchyliophora*) and perhaps a rooster-tail (*Strombus gallus*). Glenn warned us that we had to look carefully for the carriers since their camouflage is so effective. So I set out, travelling parallel to the beach and in water as deep



Above: Dominican Republic skyline. Photo by Brenda Kreis.

Below: Our hotel nestled between the ocean and the mountains. Photo by Linda Powers.



as I thought I could dive, covering veritable acres in several hours. And...no *Xenophora*.

The next day I tried a new approach to finding *Xenophoras*. I simply did not look for them since I thought the search was hopeless. Then, swimming away from the grass into a sand patch, I noticed a little round patch of algae. I swooped down

* The shellers in addition to Glenn, Randy and myself, included Mel Abe, Rachel Mann, Homer Rhode, Matt and Dona Blaine, Winston and Elizabeth Barney, Bill and Brenda Kreis, Clare Horner, Rita Stonehouse, Ruth Middlebrooks, Linda Powers, Marilyn Boyd, Bet Hamilton, Ted and Ellen Strasser, and Alan Gentleman.



An early morning visitor outside the hotel room. On vacation from Australia perhaps? Photo by the author.



A flock of flamingoes contributes to the exotic atmosphere of this wonderful place. Photo by Brenda Kreis.



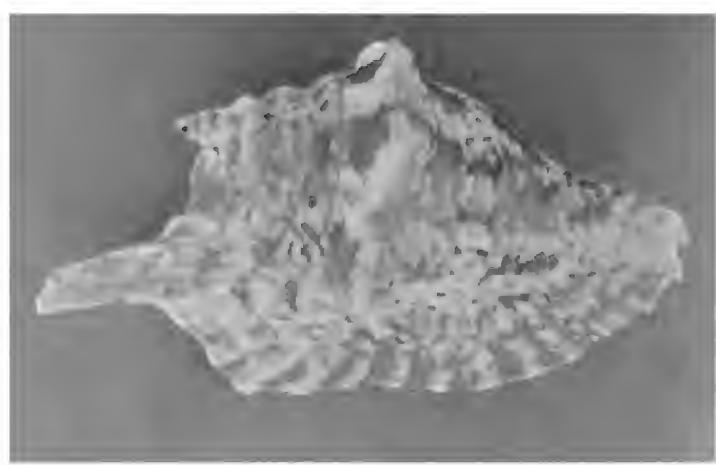
The group gathers to inspect a bonus haul of *Xenophora conhyliophora* and other treasures. Photo by Brenda Kreis.



A pile of queen conch shells in the bush, harvested from the turtle grass flats for bait or maybe a meal. Photo by Brenda Kreis.



Low tide shelling was a chance to check tide pools while snorkelers expanded their search range. Photo by Brenda Kreis.



Bet Hamilton's rooster-tail conch. Despite plans to collect this species, it proved to be rather elusive. Photo by author.



Above: Clare Horner's queen helmet. This deep orange color tends to fade over time to peach. Photo by the author.



These exquisite little *Epitonium lamellosum* are difficult to spot, hidden in the tideline drift, but Ellen Strasser had the "eye" and found near-perfect specimens. Photo by the author.

Below: The spectacular golden Atlantic Triton's trumpet (*Charonia variegata*) found and photographed by Matt Blaine.



and of course it was a *Xenophora* – my first. As the trip continued, we all found them here and there and I ended up with a nice size sequence. In fact, one of mine, covered with tiny pebbles, is less than an inch wide.

There were many fine shells retrieved from the grasses over the days. Matt brought in a handsome golden variety of *Charonia variegata*. I was amazed to see a lovely little red *Conus daucus* simply lying in the turtle grass. Glenn and Clare found many beautiful *Fasciolaria tulipa*. There were lovely milk conchs (*Strombus costatus*) and I could not resist a small specimen whose dorsum was a deep rich dark red. Bet found one of two rooster-tail conchs recovered during the trip. Marilyn found two most attractive hawk-wing conchs (*Strombus raninus*).

Some very collectible bivalves were also to be found: *Argopecten gibbus*, *Caribachlamys sentis*, *Arcopagia fausta*, *Tellina listeri*, *Ctenocardia media*, *Dallocardia muricata*, *Trachycardium magnum*, and *Trachycardium isocardium*.

Beach Reading

Each day an intrepid group carefully combed the multiple tide lines up and down the beach, heads down, carefully reading the flotsam and jetsam, and the tide pools left exposed by the low tides. From their thoroughness some of the most exciting finds emerged. Perhaps most intriguing were the *Epitonium lamellosum* specimens that Ellen seemed to have a magic touch for spotting on one of the higher tidelines. She brought in six from one day of beach walking and we all gasped in admiration (and a wish to find some ourselves). The next day, first thing, I stalked along the sand, head down and eyes swiveling in that all-too-familiar shelling posture, and there it was, lying out just waiting for me to happen by. Clare also found one, as well as a perfect live *Pecten ziczac*, right where the waves lapped on shore. Just offshore, in a few inches of water, I found a colorful *Spondylus ictericus*. Mel actually found a large live *Conus daucus* on shore.

Reef Encounters

The first few days of the super low tides exposed an on-shore reef where the adept sheller had a rare opportunity to scan the nooks and crannies and tide pools for small mollusks, while being careful to avoid the spiny sea urchins nestled alongside. Among the best finds were live *Cymatium nicobaricum* and *Gemophos tinctus*.

Glenn arranged a night snorkel for those of us who wanted to participate, so Homer, Clare, Linda, Bill, and I retrieved our dive lights and decided to take the plunge. On arriving at the pathway to the beach we encountered armed men in camouflage. Apparently the area is closed after sunset. With his usual tactful persuasiveness, Glenn convinced them to let us go ahead. While we didn't find a lot of mollusks out taking an evening stroll on an offshore reef, we enjoyed the beautiful night and armed police protection.

Other days, the reefs yielded some fine shells. Linda and



A rather impressive *Cymatium femorale* found (and photographed) by Bill Kreis. Even those who do not collect Ranellidae find room for this handsome shell in their collection.

I found *Cypraeocassis testiculus*, *Conus regius*, *Conus jaspideus* (in an unusual purple shade), *Cypraea cinerea*, *Cypraea acicularis*, and *Oliva jamaicensis*.

Show Some Spine

One day we piled into two boats for an enjoyable trip around the mangroves where, before arriving at a far beach, we sighted a spectacular flock of flamingoes. On shore there were *Asaphis deflorata* and for me, an Atlantic planaxis (*Planaxis nucleus*). Among the best finds were live *Cymatium nicobaricum* and *Gemophos tinctus*. The shells here were not as prolific as those from Punta Salinas beach, although persistent Clare finally came in with a live pair of *Chicoreus brevifrons*.

Completing the boat trip was a crossing back over to another unplumbed area of the Punta Salinas beach. Here Alan retrieved a rare and deep-water *Chicoreus spectrum*, which may have been dumped by fishermen. Later Bill found one, also probably dumped.

While excitement about this shell swirled on shore, several of us worked offshore in an area that was breathtaking for the number of huge, spiny sea urchins present. There was almost no way to avoid contact with them. Sure enough I felt a sharp pain

and found that a spine that had gone right through the pad of my smallest finger, evidenced by a narrow black stripe underneath my skin. Nothing deterred me from further shelling and I decided it could wait until the end of the day. Amazingly, by the time I got back to the hotel, ready to do some radical self-surgery with my sewing-kit needle, most of the spine had dissolved.

It's The Pits

Interspersed among the acres of turtle grass were gray volcanic sand pits that were well-worth searching for shells. Arrayed out here-and-there were a variety of bivalves, such as paper cockles (*Papyridaea soleniformis*), buttercup lucines (*Anodontia alba*), and the ever-ubiquitous codakia, *Codakia orbicularis*. I couldn't resist taking a few pairs that had especially bright yellow interiors.

Swimming slowly along, I spotted a *Latirus*-shaped shadow on the bottom and headed down like a shot. *Latirus infundibulum*! Soon I found another and Bet, nearby, retrieved two.

Apparently helmet shells (*Cassis*) favor both sand and grassy habitats. For us, these beautiful treasures seemed to favor the sand. Lucky shellers found them either completely on top of

the sand surface, or with enough of a shoulder protruding to give them away. Clare pulled up a spectacular queen helmet (*Cassis madagascariensis*), as did Linda. Others found *Cassis flammea* and *Cassis tuberosa*, such as the one I found with colorful wide dark brown bands on its outer lip. Glenn said this was an unusual color trait.

Going to the Bleach

As with any shell trip, we'd want to stop on the way back to the hotel for the 'ABC's' of shelling – alcohol, baggies, and Clorox, especially the latter as Glenn had encouraged us to clean our shells as we went along. There was another thing we wanted, ice cream. It's been my experience that a day in the water develops a compelling craving for ice cream (*helado* in Spanish). We would tumble out of the vans at a little open bodega and clustering around the counter we'd try to explain to the pleasant but non-English speaking clerks that we wanted "Clorox," while hungrily licking the chocolate popsicles we had dug from the little freezer in the corner. This scenario occurred day after day. I would stand back and wonder what our contingent looked like to the locals, as we nodded vigorously when still another bottle of Clorox was retrieved from behind the counter and as we scrabbled in our packs for our pesos, ice cream already dripping onto our damp and sandy wetsuits.

We enjoyed our meals at the hotel, which featured delicious and fresh seafood and if one wanted a change, amazingly tasty pasta. Our server, Damien, was particularly personable. There were no desserts available, which fueled our craving for ice cream.

Shells of the Trip

While the anticipated rooster-tails were not prolific (in addition to Bet's, there was only the one other that Clare found on the beach), the fascinating stone-ringed *Xenophoras* were to be found in numbers. The *Chicoreus spectrum* specimens found by Alan and Bill were dubbed as "Shell of the Trip" by Glenn, based on his extensive knowledge of Dominican Republic mollusks. Surfacing after the trip was over was a very uncommon and unusual looking find, *Cymatium (Gelagna) succinctum* (Linnaeus, 1758) brought in by Randy Hooks. According to Dr. Harry Lee, with whom Glenn consulted, this is the first report of this species in the Caribbean. Furthermore, Glenn indicated, Bill's *Conus spurius atlanticus* is also an unusual shell. Other outstanding finds were the fine *Cassis* examples (fresh, clean and beautifully marked), the gold *Charonia variegata*, and the *Conus daucus* in a range of colors.

Our trip home was uneventful, except for a one-half mile hike from the airliner arrival gate to Miami Airport customs - traveler beware! Since this was the only less-than-pleasant occurrence on this phenomenal trip, there are really only delightful memories and wonderful additions to our shell collections.

Karen VanderVen
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List of species - Dominican Republic (July 2010)

Winston Barney, Bill Kreis, Glenn Duffy,
and Karen VanderVen

GASTROPODS

Buccinidae

Gemophos tinctus (Conrad, 1846) - painted cantharus
Pisania pusio (Linné, 1758) - glossy cantharus

Bullidae

Bulla striata (Bruguière, 1792) - common bubble shell

Bursidae

Bursa granularis cubaniana (d'Orbigny, 1842) - Cuban frog shell

Cancellariidae

Trigonostoma rugosum (Lamarck, 1822) - rugose nutmeg

Cassidae

Cassis tuberosa (Linné, 1758) - king helmet
Cassis flammea (Linné, 1758) - flame helmet
Cassis madagascariensis (Lamarck, 1822) - queen helmet
Cypraeocassis testiculus (Linné, 1758) - reticulated cowrie helmet
Semicassis granulata granulata f. peristephes (Pilsbry & McGinty, 1939) - scotch bonnet, smooth form

Cerithiidae

Cerithium lutosum (Menke, 1828) - dwarf cerith
Batillaria (Lampania) minima (Gmelin, 1791) - false cerith
Planaxis nucleus (Bruguière, 1789) - black Atlantic planaxis

Columbellidae

Columbella mercatoria (Linné, 1758) - West Indian dove shell

Conidae

Conus (Dauciconus) daucus daucus (Hwass, 1792) - carrot cone
Conus (Chelyconus) ermineus (Born, 1778) - agate cone
Conus (Gladioconus) mus (Hwass, 1792) - mouse cone
Conus (Jaspidiconus) jaspideus (Gmelin, 1791) - jasper cone
Conos (Jaspidiconus) mindanus (Hwass, 1792) - Bermuda cone
Conus (Stephanoconus) regius (Gmelin, 1791) - royal cone
Conus (Stephanoconus) regius f. citrinus (Gmelin, 1791) - royal cone
Conos (Spuriconus) spurius (Gmelin, 1791) - alphabet cone

Calptraeidae

Crucibulum auricula (Gmelin, 1791) - rosy cup & saucer

Cypraeidae

Erosaria acicularis (Gmelin, 1791) - yellow cowry
Luria cinerea cinerea (Gmelin, 1791) - Atlantic gray cowry
Macrocyprea zebra (Linné, 1758) - zebra cowry

Epitoniidae

Epitonium lamellosum (Lamarck, 1822) - lamellose wentletrap
Opalia species

Fasciolariidae

Fasciolaria tulipa (Linné, 1758) - true tulip
Latirus infundibulum (Gmelin, 1791) - brown-lined latirus
Leucozonia nassa (Gmelin, 1791) - chestnut latirus
Leucozonia ocellata (Gmelin, 1791) - white-spotted latirus

Mitridae

Mitra barbadensis (Gmelin, 1791) - Barbados miter
Mitra nodulosa (Gmelin, 1791) - beaded miter

Muricidae

Chicoreus brevifrons (Lamarck, 1822) - West Indian murex
Chicoreus (Phyllonotus) pomum (Gmelin, 1791) - apple murex
Chicoreus spectrum (Reeve 1846) - pink or spectral murex
Coralliophila galea (Reeve, 1846) - helmet coralsnail
Favartia cellulosa (Conrad, 1846) - pitted murex
Muricopsis oxytata (M. Smith, 1938) - hexagonal murex
Stramonita rustica (Lamarck, 1822) - rustic rock shell
Thais deltoidea (Lamarck, 1822) - deltoid rock shell

Naticidae

Tectonatica pusilla (Say, 1822) - miniature or Atlantic moon snail

Neritidae

Nerita (Theliostyla) tessellata Gmelin, 1791 - checkered nerite
Vitta virginea (Linné, 1758) - virgin nerite

Ovulidae

Cyphoma signatum (Pilsbry & McGinty, 1939) - fingerprint flamingo tongue

Olividae

Oliva (Strephona) jamaicensis (Marrat, 1867) - Jamaican olive

Ranellidae

Charonia variegata (Lamarck, 1816) - Atlantic triton's trumpet
Cymatium (Monoplex) nicobaricum (Röding, 1798) - gold-mouthed triton
Cymatium (Ranularia) cynocephalum f. caribbaea (Clench & Turner, 1957) - Caribbean dog head triton
Cymatium (Gelagna) succinctum (Linné, 1758) - lesser girdled triton
Cymatium (Gutturnium) muricinum (Röding, 1798) - white-mouthed triton
Cymatium (Turritriton) labiosum (Wood, 1828) - lip triton
Cymatium (Septa) pileare (Linné, 1758) - common hairy triton
Cymatium (Cymatium) femorale (Linné, 1758) - angular triton

Strombidae

Strombus (Strombus s.s.) pugilis Linné, 1758 - West Indian fighting conch
Strombus (Lobatus) raninus Gmelin, 1791 - hawk wing conch
Strombus (Lobatus) costatus Gmelin, 1791 - milk conch
Strombus (Lobatus) gigas Linné, 1758 - pink or queen conch

Tonna

Tonna maculata (Dillwyn, 1817) - Atlantic partridge tun

Turbinidae

Astralium phoebium (Röding, 1798) - long-spined star shell
Lithopoma caelatum (Gmelin, 1791) - carved star shell
Lithopoma tectum (Lightfoot, 1786) - West Indian star shell
Lithopoma tuber (Linné, 1767) - green star shell
Turbo castaneus (Gmelin, 1791) - chestnut turban

Turritellidae

Turritella exoleta (Linné, 1758) - eastern turret shell

Xenophoridae

Xenophora conchyliophora (Born, 1780) - Atlantic carrier shell

BIVALVES**Arcidae**

Arca zebra (Swainson, 1833) - Atlantic turkey wing
Anadara notabilis (Röding, 1798) - eared ark

Cardiidae

Acrosterigma magnum (Linné, 1758) - magnum prickly cockle
Ctenocardia media (Linné, 1758) - Atlantic strawberry cockle
Dallocardia muricata (Linné, 1758) - yellow prickly cockle
Laevicardium serratum (Linné 1758) - egg cockle
Papyridea soleniformis (Bruguière, 1789) - paper cockle
Trachycardium egmontianum (Shuttleworth, 1856) - prickly

cockle

Chamidae

Chama congregata Conrad, 1833 (attached to *Chicoreus pomum*) - little corrugated jewel box

Corbiculidae

Polymesoda floridana (Conrad, 1846) - southern marsh clam

Glycymerididae

Glycymeris decussata (Linné, 1758) - decussate bittersweet

Limidae

Ctenoides mitis (Lamarck, 1807) - smooth flame scallop
Ctenoides scabra (Born, 1778) - rough flame scallop

Lucinidae

Anodontia alba (Link, 1807) - buttercup lucine
Codakia orbicularis (Linné, 1758) - tiger lucine
Lucina pensylvanica (Linné, 1758) - Pennsylvania lucine

Mytilidae

Modiolus americanus (Leach, 1815) - tulip mussel

Pectinidae

Caribachlamys sentis (Reeve, 1853) - scaly scallop
Euvola ziczac (Linné, 1758) - zigzag scallop
Argopecten gibbus (Linné, 1758) - calico scallop

Pinnidae

Pinna carnea Gmelin, 1791 - amber pen shell

Pteriidae

Pteria columbus (Röding, 1798) - Atlantic wing oyster
Pinctada imbricata (Röding, 1798) - Atlantic pearl oyster

Spondylidae

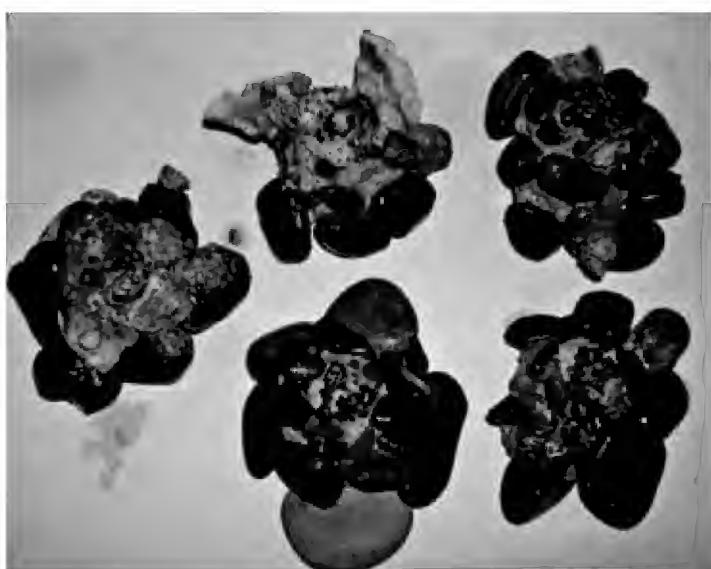
Spondylus ictericus (Reeve, 1856) - digitate thorny oyster

Tellinidae

Arcopagia fausta (Pulteney, 1799) - lucky tellin
Leporimetis intastriata (Say, 1826) - twisted duck clam
Tellina listeri (Röding, 1798) - speckled tellin

Veneridae

Liophora paphia (Linné, 1758) - king Venus
Macrocallista maculata (Linné, 1758) - calico clam
Periglypta listeri (Gray, 1838) - princess Venus



Algae gone, the *Xenophora conchyliophora* are still hidden under their stone armor. Photo by Winston Barney.

Cracking a queen conch (*Strombus gigas*), vanishing uses, and rare abnormalities

Robert Robertson (photos by author unless noted otherwise)

Strombus gigas Linnaeus, 1758, now sometimes called *Eustrombus gigas* or *Lobatus gigas*, was once common in the greater West Indian region in shallow waters down to known depths of 61 meters. It is relatively low on the food chain, being the largest herbivorous gastropod present, and is being fished out in places throughout its range. This may have undesirable long-term effects on the shallow water ecology of the region because this species has or had a wide range of predators feeding on it, including *Homo sapiens* Linnaeus, 1758.

In 1992 *Strombus gigas* was listed as a “threatened” species by the Convention for International Trade of Endangered Species (CITES). It was listed under Appendix II, the first large-scale fisheries product to be regulated by CITES. Fortunately, *S. gigas* can be cultured in the lab and populations, at least theoretically, can now be enhanced artificially. Nonetheless, it seems worthwhile to publish old observations and photographs showing how humans interacted with and used this species. Archeological “kitchen-middens” of queen conch shells with round holes in them show that pre-Columbian Lucayan Indians in the Bahamas used the species as food.

Until recently, Bahamians used dinghies to fish for queen conchs, with one man sculling over the stern and another man near the bow with a “conch hook” on a long pole. Visibility was enhanced with a glass-bottomed bucket (“water glass”). After being hooked into the boat, the living conchs would survive for some days if kept damp with seawater.

Most gastropod bodies, including those of conchs, are attached inside the shell by only a single muscle, the columellar muscle. Bahamian fishermen used to be adept at making a slit in the spire of the shell with a hatchet (preferred over a machete), a process called “cracking” (or “knocking”) a conch. Placement of the slit has to be precise (see the location shown in the photos). A knife is next inserted in the slit to cut the muscle. The whole body then slides easily out of the shell. The body is varicolored and only the muscular parts are eaten or used for fish bait.

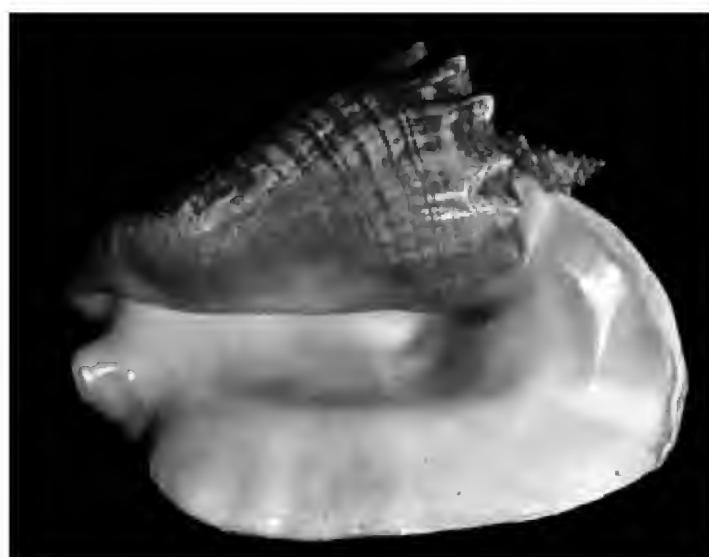
The empty shells can be used as ornaments or tools, but they also used to accumulate in huge piles or middens. Such conch piles are often near aggregations of living conchs, but they can also be found near towns and settlements (as shown here). Before refrigeration, the meat was dried and then transported for use in other areas. Occasionally the shells from such middens were made use of, as for example being incorporated into the concrete walls of a house. The shells also used to be burned with wood and charcoal to make lime. A use growing in popularity today involves the porcelaneous pink, yellow, or white conch pearls sometimes found in these shells and recently commercially cultured (see *American Conchologist*, 37(4), December 2009).

Shells with rare abnormalities can sometimes be found in the middens, although the shells illustrated here with spirally keeled apices may not have come from such a source. Double outer lips and odd apical knobs occur, but sinistrality has not yet been reported in Strombidae (although a generous price has been adver-

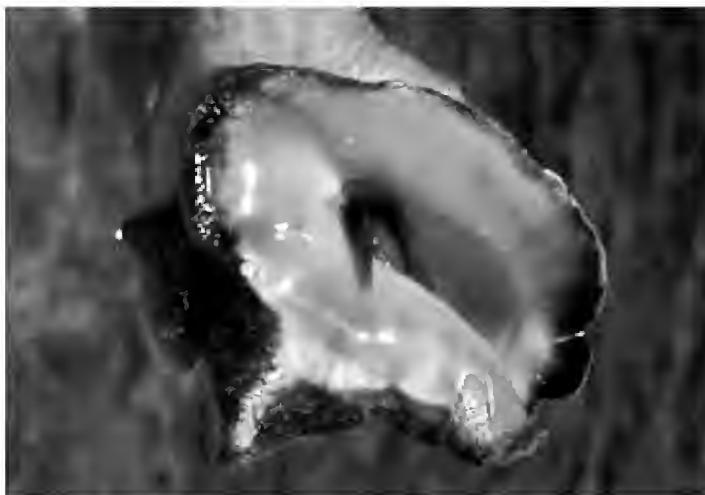


Above: The approximate range of *Strombus gigas* in light blue. Map is from the U.S. National Oceanic and Atmospheric Administration (NOAA).

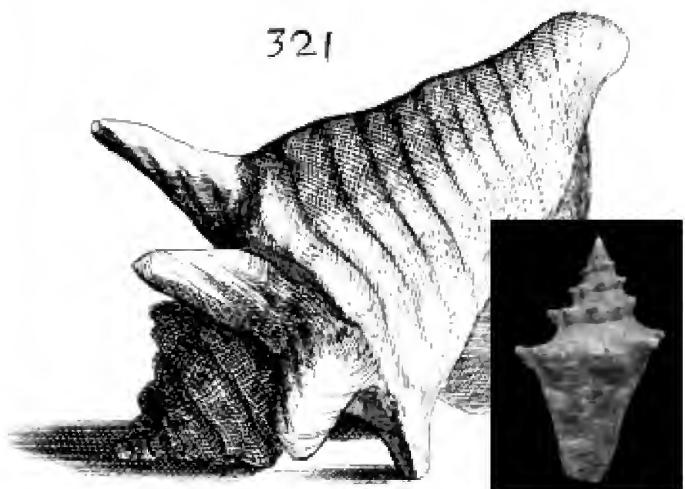
Below: A freshly collected specimen of *Strombus gigas* showing the vividly colored aperture. These colors will fade in time.



tised for such an abnormality). A thorough morphological study of intraspecific shell variation in conch piles might have taxonomic implications. Space limitations cause museum samples of large species to be necessarily sparse. Sample sizes of some of the taxa recently described are tiny and the generic characters used tend to be nebulous. An intergeneric hybrid has also been reported, but of course, this does not disprove generic rankings. Such rankings are by their very nature, subjective. So far, phylogenetic inferences from anatomical and molecular data differ. Without further infor-



A living *Strombus gigas* (Bahamas) showing the operculum and part of the foot. This small heavy form was named *Strombus samba* by Clench in 1937. This name is generally considered a synonym today.



Strombus gigas (wrongly printed sinistral) in *Recreatio mentis et occuli* (1684) by Philippo Bonanno, named the neotype by Abbott and Clench in 1941 when the original Linnaean type specimen was thought lost. The actual holotype (inset) was found in 1953 at Uppsala University.



Conch fishermen in native sloops at dock, Nassau Harbor, Bahamas, May 1966. Note the dark periostracum as well as algae and other encrustations typical of shallow water species.



The late Beltron Malone, a fisherman at Hope Town, Abaco, Bahamas, opening ("cracking") a queen conch with a hatchet, August 1970.



Queen conch with knife in slit (“crack”) severing internal columellar muscle.



Dorsal view of a “cracked” conch shell showing the precise positioning of the slit through which the columellar muscle was cut.



The soft body parts of *Strombus gigas* removed from the shell. The brown portion on the left is the edible foot.

mation, we would seem to presently be at an impasse, leaving us to enjoy this often colorful shell, appreciate its long shared history with mankind, and hopefully preserve it in the wild.

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Piles (middens) of recently discarded *Strombus gigas* shells, Hawksbill Creek, Grand Bahama, Bahamas, July 1983.



Conch shells being burned to make lime, Acklins Island, Bahamas, September 1958.



A closer view of a portion of a midden in Belize City, Belize, July 1961.



House incorporating *Strombus gigas* shells, Cockburn Harbor, South Caicos, Turks and Caicos Islands, January 1968. Photo by G.F. Quinby.

Apices of *Strombus gigas* shells, the upper two showing the abnormal form named as *Strombus canaliculatus* by Burry, 1949. This name is now considered a synonym. The bottom shell shows the normal spine development.



Perfect weather and record crowds marked the 75th Annual Sanibel Shell Show on the 3rd of March 2011. From door opening to closing, more than 2,000 people took advantage of this event to view the many colorful shell displays. Most participants also walked away with one of the more than 1,800 bags of shells that were provided free to visitors. This year was the first for the Sanibel Superstar Trophy, awarded to long-time COA member Gene Everson.

2011 Shell Show Special Awards

Scientific Division

DuPont Trophy: Best in Classes 1-26, sponsor: Delaware Museum of Natural History, winners: **Ken & Joyce Matthys**

C.O.A. Award: entry that best furthers interest in shells & shell collecting, sponsor: Conchologists of America, winner: **Pat Linn**

Sanibel Shell Fair Perpetual Gold Cup: best in class 11, Sanibel-Captiva Shells - self-collected, sponsor: Sanibel Community Association, winner: **Barbara Hansen**

Howard Sexauer Award: best worldwide shells, sponsor: The Sexauer Family, winner: **Sheila Nugent**

Shell of Show (any source): best single shell in show, sponsor: Sanibel-Captiva Shell Club, winner: **Irene Longley**

Marilyn Northrop Memorial Award: Shell of Show: self-collected, sponsor: Gene Everson, winner: **Gene Everson**

Shell of Show: fossil, best single shell included in any fossil exhibit, sponsor: Sanibel-Captiva Shell Club, winner: **Irene Longley**

Best of the Blues: best in class 26, sponsor: Sanibel-Captiva Shell Club, winner: **Irene Longley**

Sanibel Superstar Trophy: most outstanding entry in Class 27, sponsor: Sanibel-Captiva Shell Club, winner: **Gene Everson**

Judges' Special Awards: one awarded by each scientific judge to

any exhibit, sponsor: Sanibel Captiva Shell Club, winners: **Barbara Hansen** and **Carole Marshall**

Judges' Merit Ribbons: awarded to a non-blue ribbon exhibit that judges felt was noteworthy of recognition, winner: **Harry Berryman**

S.C.A Trophy: best student exhibit, sponsor: Sanibel Community Association, winner: **Bethany Namour**

Artistic Division - Hobbyist

Myrtle Williams Weinstein Perpetual Trophy: best shell flower exhibit, sponsor: The Weinstein Family, winner: **Leslie Anding**

Gertrude A. Ford Perpetual Trophy: best miniature flower arrangement, sponsor: The Ford Family, winner: **Tyler Schoenherr**

Best Picture or Mosaic: sponsor: She Sells Sea Shells, winner: **Carol & Martin Strange**

Flo Ioreo Pertetual Memorial Trophy: best lamp, sponsor: Shellcrafters of the SCA, winner: **Eileen Underwood**

Wanda Will Perpetual Memorial Trophy: best jewelry, sponsor: Shellcrafters of the SCA, winner: **Elaine Alvo**

Dorothy K. Putnam Trophy: best mirror, sponsor: SCA, winner: **Ethel Weber**

Best Single Sailor's Valentine: sponsor: She Sells Sea Shells, winner: **Adelaide Coy**

Best Miniature Sailor's Valentine: sponsor: Sandy Moran, winner: **Cynthia Lamb**

Best Double Sailor's Valentine: sponsor: Lily & Co., winner: **Hans Peter Hoppenbrouwers**

Bettie K. McGowan Memorial Trophy: best holiday exhibit, sponsor: The McGowan Family, winner: **Susan Ross**

Best Shell Related Exhibit: sponsor: The Lesinski Family in honor of John & Grace Sheperd, winner: **Marilee McNeilus**

Daniel E. Malone Memorial Trophy: best student exhibit, sponsor: Island Reporter, winner: **Anna Fastenau**

Best in Show: sponsor: Bailey's General Store, winner: **James Cowperthwait**



Artistic Division - Professional

Best Single Sailor's Valentine: sponsor: Sanibel Seashells, winner: **Suzanne Marie Dietsch**

Best Double Sailor's Valentine: sponsor: The Bank of the Islands, winner: **David Rhyne**

Best Miniature Sailor's Valentine: sponsor: Sandy Moran, winner: **Karine Mirzakhanyan**

Best Medium Sailor's Valentine: sponsor: Lily & Co., winner: **Wendy Marshall**

Best Flower Exhibit: sponsor: Susan Andrews, Sanibel Susan Realty Associates, winner: **Brandy Llewellyn**

Meta Neujahr Perpetual Award: sponsor: SCA & The Neujahr Family, winner: **Cheryl Whitten**

Best Picture or Mosaic: sponsor: Rosier Insurance - Marge Meek, winner: **Karine Mirzakhanyan**

Best Miscellaneous Exhibit: sponsor: Jerry's Foods, winner: **Charles Barr**

Best in Show - Captain Tom Clifford Memorial Trophy: sponsor: M. Patricia and Dennis Clifford, winner: **David Rhyne**

All Artistic

Judges' Special Award: one awarded by each artistic judge to any Artistic Division exhibit, winners: **Donna Carey** and **Barbara Walling**

Judges' Merit Ribbons: awarded to a non-blue ribbon exhibit that judges felt was noteworthy of recognition, winners: **Sandi Blanda** and **Susan Saunders**



For the second year in a row, Pat Linn won the COA Award. She is shown here with her eight-foot display of Xenophoridae.



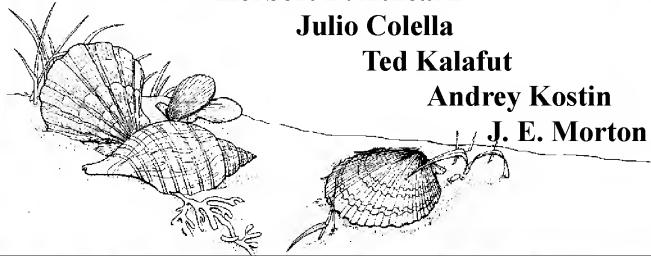
Barbara Hansen won the Sanibel Shell Fair Perpetual Gold Cup for Sanibel-Captiva self-collected shells.



Gene Everson was awarded the first Sanibel Superstar Trophy.



Charles Barr won best miscellaneous art exhibit.

In memoriam:**Herbert D. Athearn****Julio Colella****Ted Kalafut****Andrey Kostin****J. E. Morton****Herbert D. Athearn 1924-2011**

Herbert Athearn passed away 9 January 2011 at age 87.

He grew up the oldest of three brothers, all interested in natural history (as was their mother). As a teenager he became involved as a specimen collector for the Cambosco Scientific Company (later the Cambridge Botanical Society), supplying natural history specimens (insects, fish, reptiles, shells, plants, etc.) to various schools and universities. Herb's collecting trips brought him an intimate knowledge of the nations waterways and wilder areas.

After serving in the US Army during WWII, Herb worked for Glenwood Range Company in Massachusetts and volunteered at the Museum of Comparative Zoology at Harvard University, Cambridge, Massachusetts. He became Curatorial Assistant under William Clench and Ruth Turner, and worked with both the museum collection and with field collecting. Herb married and in 1955 moved to Tennessee where he worked as a postal carrier. He collected before the war, but added an intensity after moving to Tennessee. His cataloged collection of freshwater snails, mussels, and clams totaled over 23,000 lots (more than 13,000 were freshwater mussels) and at least 25% of his collection had yet to be cataloged upon his death. Arthur Bogan and Paul Johnson in *Ellipsaria* (March 2011, vol. 13, no. 1, pp. 31-33), wrote, "Herbert D. Athearn is generally regarded as the most widely traveled and prodigious collector of freshwater mollusks in the 20th Century. No other individual made such widely dispersed and prolific collections of freshwater mollusks. His collection records are often the first or only species locality data recorded for many water bodies."

From 2000 to 2007, Herb transferred his collection to the North Carolina State Museum of Natural History where it will keep several freshwater unionid enthusiasts quite busy, now and in the future.

**Julio Colella 1926-2011**

I just returned from the Paris Shell Show where I saw old friends, but sadly learned the bad news that our dear friend Mr. Julio Colella passed away at age of 85. He was one of the first shell collectors we met back in 1983 when we went to a meeting of Sociedade Brasileira de Malacologia (SBMA). He invited Jose and me to go to his home and literally gave us dozens of shells on this first visit! He and his family always made us feel welcome and at home during the many hours we spent looking through his collection. He had thousands of species of mollusks and at that time we had maybe 400. Julio was one of the founding members of Conquiliologistas do Brasil (member number six).

After his wife Myra passed away a few years ago he moved to Santos (a city on the beach about 60 kilometers from São Paulo) with his collection. In this picture are both Jose (right) and myself (left), with Julio and Myra in the middle.

Marcus Coltro

It is with great regret that we have to inform you that our dear friend Andrey Kostin died in a tragic accident on Saturday 2 July. We are deeply saddened, beyond words, and our thoughts are with his family. The shell community lost a passionate collector, so full of life, humor and good spirit. He was an avid diver and traveler in search of shells and adventure. Andrey shared our love for the ocean and our vision of discovering more secrets of the sea. When diving for shells in the future we will always remember his enthusiasm during our shared travels and adventures.

**Andrey Kostin****1978-2011**

Jana and Felix Lorenz



Ted Kalafut 1941-2011

I first met Ted Kalafut at the January 1976 Greater Miami Shell Club Annual Shell Show. Ted and I spoke only briefly during that event and I realized he knew shells and shell collecting. Within the next year we had our first collecting trip together, and by 1978, Ted entered a shell show exhibit for the first time. This would mark the beginning of Ted's many Florida and Caribbean shell exhibits, most taking top honors. We collected together on a number of trips and soon developed several special collecting spots throughout Florida, the Keys, and then over to the Biminis, Eleuthera, Bahamas, Bonaire, and especially Roatan, Honduras. We worked the lobster traps at most sites and I soon discovered it was best to let Ted approach the fishermen alone. He would wander over with a six pack under one arm and the other extended for a handshake. Within minutes the group was laughing and trading stories. After about 30 minutes Ted would walk away with a large box of shells and the fishermen wishing him the best. I would have been lucky to get the time of day from the same group.

Ted discovered some 8 or 10 new species and he ended up having maybe half that many named for him. A favorite was the small but often bright red *Conus kalafuti* (see his story about this shell in the December 2007 *American Conchologist*). Ted ended up spending 9 to 10 months of the year on Roatan and was a shell dealer for a number of years. There are a number of collectors who have Honduran shells because of Ted. In his prime collecting days he could free-dive to 60 or 70 feet. Even when such feats were things of the past he kept up his interest in shells and became a talented photographer. He will be missed by those who knew him, and for those who didn't, just ask and we can tell you lots of stories.

Bob Pace



Conus kalafuti da Motta, 1987



John Edward Morton 1924-2011

John Edward Morton died on the 6 March 2011 at the age of 87. John was a graduate of Auckland University and moved to the University of London to study for his PhD under the supervision of Alistair Graham. He remained in London as a lecturer until he returned to New Zealand in 1960 to take up the position of foundation Professor of Zoology at the University of Auckland. He was an inspirational teacher, instrumental in establishing the Leigh Marine Laboratory and built an excellent department where he stayed until his retirement. He was actively engaged in environmental causes in New Zealand, particularly in the latter stages of his career and after his retirement.

He produced many outstanding works on mollusks, including his book "Molluscs," first published in 1958, which proved very popular and went to nine editions. He published several other books, including some on seashore ecology, the most recent on Pacific shores in 2004.

Winston Ponder (a JEM student)

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Quarterly Journal of the Conchologists of America, Inc.



2011 COA Convention

Tom Eichhorst (photos by the author and other COA members)

The 2011 COA Convention was held at the Radisson Resort at the Port, Cape Canaveral, Florida, 13-17 July. For many attendees this was a trip down memory lane as we last met here 10 years ago. The hotel was the same huge rambling affair with great amenities and a friendly and helpful staff. The pool still looked like it had been cut out of a cliff of huge boulders and the grounds still had numerous grass-lined trails through areas of palm trees and other tropical vegetation. Surprisingly, even though the rooms had been upgraded and refurbished, the room rates were the same as 10 years ago! New this year was the venue for the bourse. For 2011 we gathered under a huge tent-like building for a bourse that included 42 dealers. A grand ending for a wonderful adventure. What about the other events?

COA Convention 2011 opened with a welcome party, "Space Coast Treasures." This gala featured lots of folks in pirate costume, some really great food and drinks, a couple of mermaids, and fun musical entertainment. COA President Alice Monroe greeted the 188 attendees on behalf of the Astronaut Trail Shell Club, sponsor of this year's event. Like a swimming duck, things looked calm and well controlled on top of the water, but underneath there was some furious paddling. Convention goers saw chairpersons Alan Gentleman and Doris Underwood at the podium calmly orchestrating events and introducing speakers, but "underneath" were numerous volunteers (from various clubs) whose paddling ensured the talks, auctions, dinners, field trips, meetings, and registration went smoothly and without incident. Thanks are certainly owed to the many who made this year's event such a success. The hard workers this year included:

Dona Blaine	Matt Blaine	Jim Brunner
Linda Brunner	Steven Coker	Jim Cordy
Ed Dunham	Alan Gentleman	Phyllis Gray
Eleanor Hillman	Linda Koestel	Harry Lee
Bob Linn	Pat Linn	Betty Lipe
Bob Lipe	Charlotte Lloyd-Thorpe	Bill Lyons
Don Pisor	Emilio Power	Rachele Ross
B.J. Shouppé	Nan Stewart	Doris Underood

Sadly, as reported in the last issue, Bobbi Cordy, originally co-chair with Doris Underwood, passed away in February. Alan Gentleman stepped up and filled the role of vice chair to ensure a perfect convention.

The oral auction featured over 100 lots of specimen shells and shell-related artifacts. Auctioneers Harry G. Lee and Charlotte Lloyd worked the crowd until a total of almost \$7,500 was raised for COA. This will go towards our annual academic grants awards, again totaling \$15,000 for the year 2011. Thanks to all who participated, both those who bought items and those who donated items to be auctioned. As an example of our membership largess, Bob and Juying Janowsky, of Mal De Mer Shells, Books, & Stones (www.mdmshellbooks.com), donated two gift certificates, one for \$50 and one for \$100. The \$50 gift certificate sold

for \$80, and the \$100 gift certificate sold for \$120!

The programs this year, as usual, were varied and interesting: ranging from tips on shell photography, to pearl culture, to rare shells, to marine and land shells of the Hawaiian Islands, and so on. Also presented were the specifics about the 11 grant recipients who were awarded COA Academic Grants for 2011.

The penultimate convention event was the banquet on Friday evening where Jose Leal brought everyone up to speed on recent happenings at the Bailey-Matthews Shell Museum on Sanibel Island, Florida. The ultimate experience was, of course, the bourse, a world-renown event where thousands of shells and related items are displayed for sale. Also on sale this year were several new books - enough to put my checked luggage in the "overweight" category.

So there you have COA 2011. A week spent with new and old friends, immersed in shells and shell-related activities, in a wonderful vacation spot. The COA convention is perhaps the pinnacle of benefits of COA membership. If you haven't been, you really do owe it to yourself to make plans now to attend next year's convention. Set aside a bit of money each month and set the upcoming convention in Philadelphia as a goal for 2012. Next year's event will be a "joint" meeting of the American Malacological Society (AMS) and COA. AMS will meet from Saturday 16 June to Thursday 21 June 2012. COA will meet from Tuesday 19 June to Saturday 24 June 2012. The hotel will be the Crowne Plaza in Cherry Hill, New Jersey (just minutes from the Academy of Natural Sciences, Philadelphia). There is a lot to see and do within a short distance from the hotel. Hopefully, I'll see you there.



Dennis Sargent providing some smooth melodies at the welcoming party. Photo by John Jacobs.



Left to right, pirates: Karlynn Morgan, Charlotte Lloyd-Thorpe, & Vicky Wall. "Avast ye maties!" Photo by John Jacobs.



Sue Hobbs directs traffic behind her display tables as shellers line up with their purchases. Photo by John Jacobs.



A unique shell show entry by Harry Lee - a pair of *Semele rupestris* Dall, 1915 (the rock semele) that have matured inside a bottle. Photo by John Jacobs.



THE BOURSE!!



The lineup for the bourse starts 30 minutes before the opening "bell." Photo by T. Eichhorst.



Academy of Natural Sciences, Philadelphia, the venue for the 2012 COA convention.

Sacred chank revisited

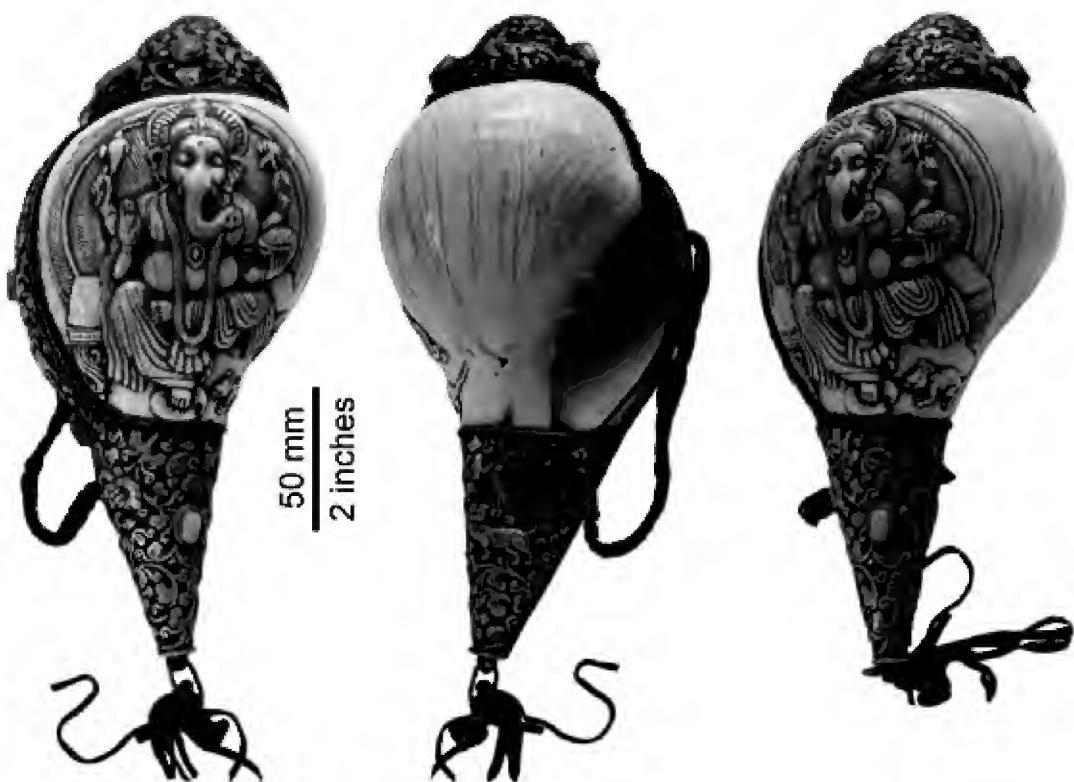
Ken Rose

After the article by Jesse Todd that mentioned and illustrated *Turbinella pyrum* (Linnaeus, 1758), the sacred chank (Conch Shells on Coins and Their Use) in the March 2011 *American Conchologist* (vol. 39, no. 1), we had a follow-up by Harry Lee (Historical notes on a sinistral sacred chank - *Turbinella pyrum*) in the June 2011 issue of *America Conchologist* (vol. 39, no. 2). Luckily, Kenneth D. Rose, a professor at the Center for Functional Anatomy & Evolution, Johns Hopkins University School of Medicine, Baltimore, Maryland, saw these articles and decided to respond with a few notes and photographs of his sacred chank.

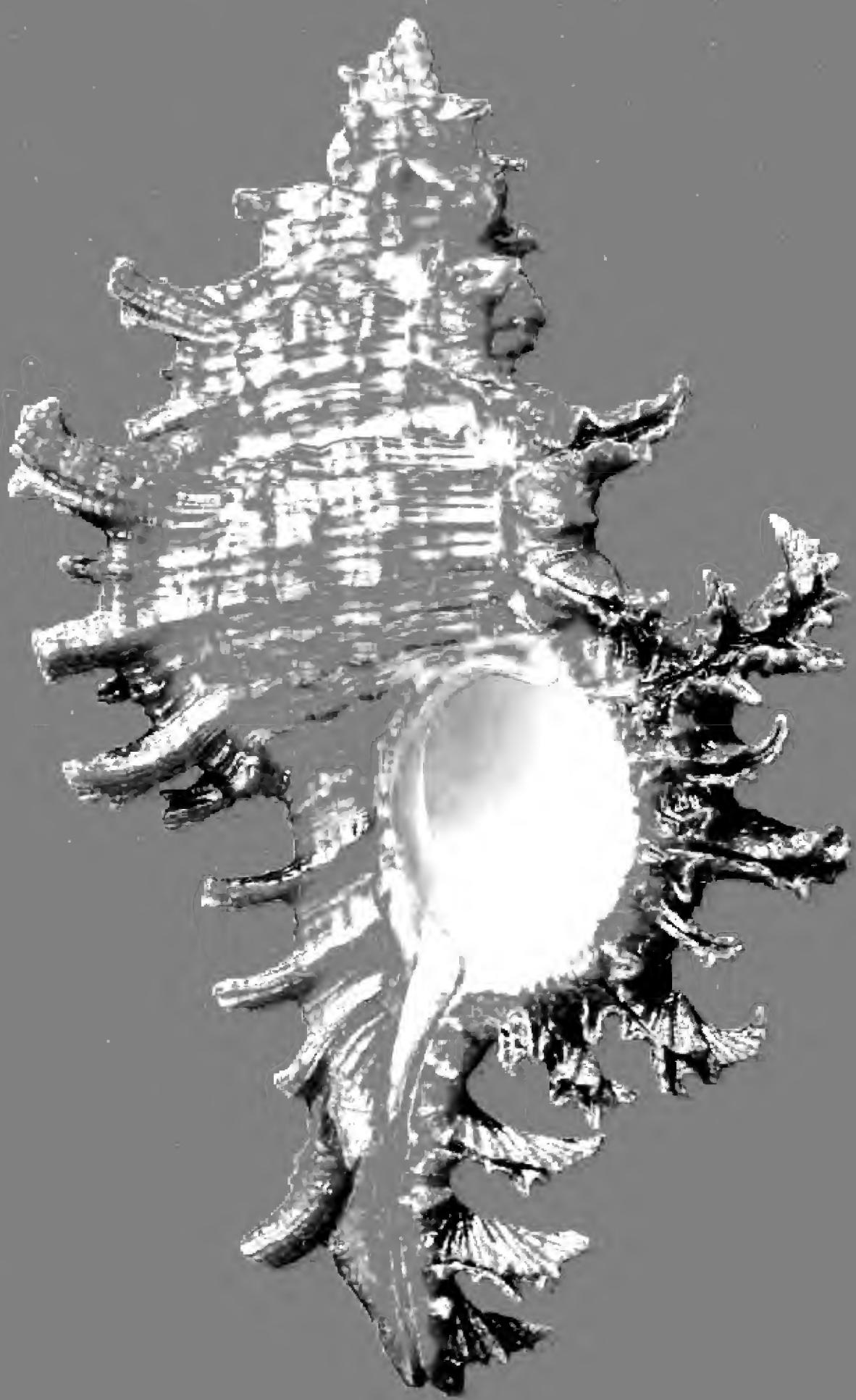
Ken Rose (who was cited by Harry Lee, (Rose, K. 1974. The religious use of *Turbinella pyrum* (Linnaeus), the Indian Chank. *The Nautilus* 88(1):1-5. Jan.)*) has been interested in shells for better than 50 years. As a teenager in the 1960s he was a member of the New Jersey Garden State Shell Club, and can lay claim to two mentors from that time - Bill Old and Tucker Abbott. If those two couldn't get a kid interested in shells, no one could. Ken has collected since that time and made use of numerous overseas paleontological expeditions over the years to also actively collect shells. In the summer of 1971 he was Gary (Geerat) Vermeij's field assistant in West Africa. After reading Harry Lee's article on the sinistral sacred chank, Ken wrote to Harry and sent along some interesting photographs. Harry copied me (the editor) and we are thus able to offer up Ken's words and his incredible shell.

"Really enjoyed your article in the June *American Conchologist* on *Turbinella pyrum* and the rarity of sinistral specimens. I was surprised and pleased to see you cite my note in *Nautilus*, written when I was an undergrad. (Probably it's only citation!) That note was inspired by a course in Hinduism I took upon returning from a year abroad (serving on a paleontological expedition in Egypt and India). A year or two later I wrote to Tucker Abbott about the paper I'd written and he encouraged me to submit it, but asked if I would include mention and a photo of the MCZ sinistral specimen, which was facilitated by Ken Boss and Ruth Turner (I was a grad student at the MCZ at the time).

I enjoyed my time in India (1969) so much that I was determined to get back there somehow. The opportunity to do so emerged a decade ago when an Indian colleague and I agreed to collaborate on a project to search for Paleocene-Eocene mammals (my specialty) in India. With support of National Geographic, we began our search in Rajasthan and continued into Gujarat where we were successful and have an ongoing project, still supported by NGS (hope to return in January). On one of our trips a few years ago, I picked up a beautifully carved *Turbinella pyrum* (9.5 inches) in the Tibetan bazaars in New Delhi. Despite years of experience in bargaining, I was unable to get a significant reduction in price-- but I finally decided that with my love of shells, and Ganesh, I had to have it nonetheless. I have not regretted the purchase." (Ken Rose, Aug 2011)



*Ken Rose's article, The religious use of *Turbinella pyrum* (Linnaeus), the Indian Chank, *The Nautilus* 88(1):1-5, Jan. can be seen online at: <http://www.archive.org/stream/nautilus88amer#page/n5/mode/2up>



Vol. 39, No. 4, December 2011

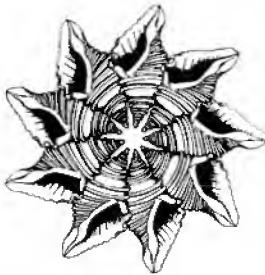
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American CONCHOLOGIST



Quarterly Journal of the Conchologists of America, Inc.

CONCHOLOGISTS OF AMERICA, INC.



In 1972, a group of shell collectors saw the need for a national organization devoted to the interests of shell collectors; to the beauty of shells, to their scientific aspects, and to the collecting and preservation of mollusks. This was the start of COA. Our membership includes novices, advanced collectors, scientists, and shell dealers from around the world. In 1995, COA adopted a conservation resolution: Whereas there are an estimated 100,000 species of living mollusks, many of great economic, ecological, and cultural importance to humans and whereas habitat destruction and commercial fisheries have had serious effects on mollusk populations worldwide, and whereas modern conchology continues the tradition of amateur naturalists exploring and documenting the natural world, be it resolved that the Conchologists of America endorses responsible scientific collecting as a means of monitoring the status of mollusk species and populations and promoting informed decision making in regulatory processes intended to safeguard mollusks and their habitats.

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Editor's comments:

As we begin the year 2012 I must remind all COA members to please let the COA Membership Director, Doris Underwood (dunderwood13@cfl.rr.com) know if you change your mailing address. For U.S. members, please note that the U.S. Postal Service does not forward bulk mail. If you pay annual dues of \$25, then you get your magazine via bulk mail - no forwarding service. If you pay \$30 per year (U.S. members), then your magazine is mailed first class and will be forwarded. In any case, Doris has to be notified so she can change the mailing label.

Next a word about the COA annual conventions. I realize we are talking about a fair amount of money for plane tickets, hotel, and meals. Seems like this might just as well be spent on shells, but if you can afford it, the convention offers quite a bit - as well as shells if you are so inclined (and still have any money left). I have a number of "shell" friends I would never have met if I had not attended COA conventions. I have also had some great experiences: an evening listening to Jack Lightbourn talk about his experiences in WW II, a day on a river with COA freshwater mussel experts, an evening talking with Tom Rice about the early days of *Of Sea And Shore*, countless informal discussions about different molluscan families, and on and on. One evening I met a person I had traded shells with almost two decades before. I have had wonderful dinners with Dr. Thach from Vietnam, and neither of us speaks the other's language. These are a bunch of friendly people and **they share your interest in shells!** The 2012 convention in Philadelphia (see page 8) promises to be a special event at a venue unlike any other in the nation. Start thinking now about COA Philadelphia and start setting aside a few bucks. You will see something new, learn something new, and have a chance to talk to folks who really know their stuff. If you attend and don't enjoy yourself, see me about a refund. You won't get one, but I might enjoy the conversation.

And last, a couple *mea culpas* (I never seem to escape without at least one). The Sanibel Shell Show report in the September issue was in error as I reported that the 2011 show was the 75th for the club. I have been corrected. The 2011 show was the 74th and 2012, not too surprisingly, will be the 75th -- called "SHELLABration" and scheduled for 1-3 March 2012. Also in the September issue (p. 30) I credited Dr. Harry Lee with the display of the two *Semele rupicola* in a bottle. I would not be surprised if Harry had a similar specimen, but this one was exhibited by Paul Kanner who says it is back in its rightful place on his desk.

Thomas E. Eichhorst

Front Cover: *Pteropurpura plorator* (A. Adams & Reeve, 1845) 80mm, from the East China Sea. This attractive specimen is illustrated and described by Roland Houart in his article on Ocinebrinae starting on page 12.

Back Cover: *Conus harlandi* Petuch, 1987, photographed by Charles Rawlings in Trujillo Bay, Honduras, 2011. More photographs by Charles are available in his new book, reviewed on page 29.

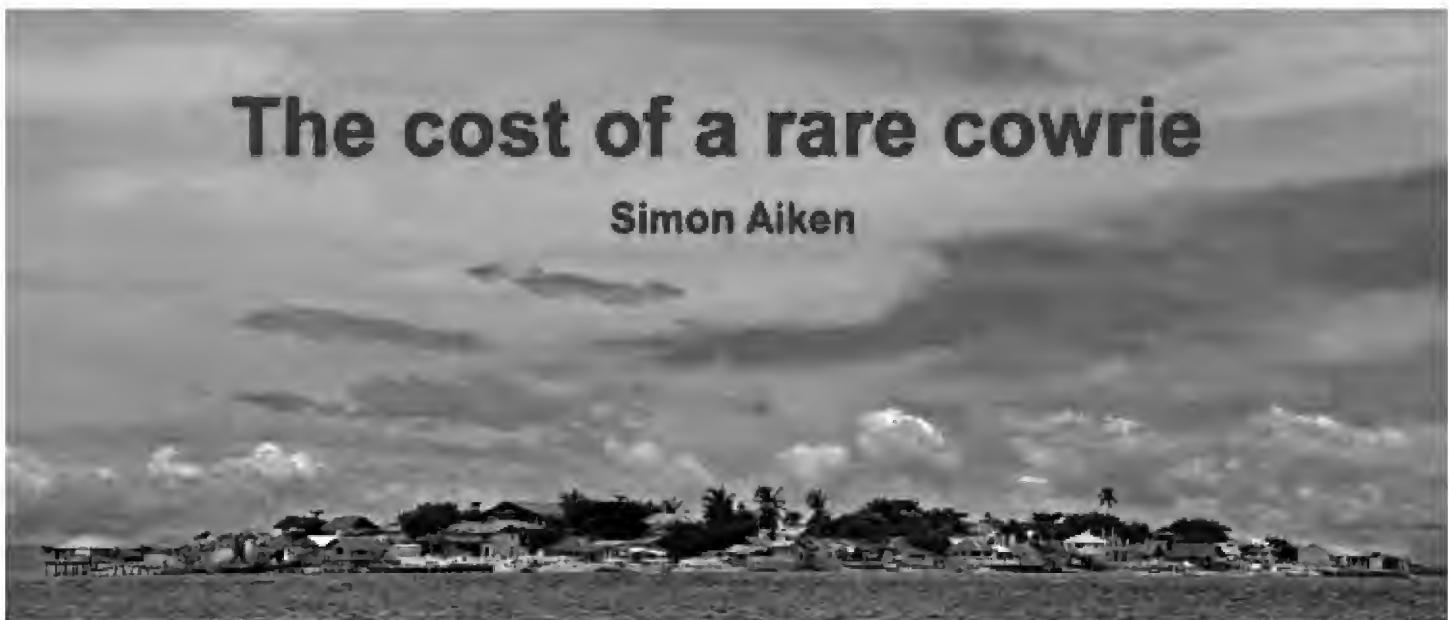


The 2011 Chinese Shell Show was held 21-22 May at Tsinghua University, Beijing, China. Tsinghua University was founded in 1911 on the site known as of “Qing Hua Yuan,” the royal gardens of the Qing Dynasty. The campus is famous for its beautiful surroundings embraced by thousands of shade trees and beautiful water gardens. It is listed in 2010 as one of the 14 most beautiful college campuses in the world by Forbes Magazine, the only such listing from Asia. I (editor) was not provided with details of the event, but the accompanying images pretty much tell the story.



The cost of a rare cowrie

Simon Aiken



"No photo before the dive!" Such is the mystique surrounding the collecting of *Leporicypraea valentia* (Perry, 1811) that I was forbidden from photographing the divers in their houses and warned not to point a camera at their boat. The residents of tiny Nocnican Island (see map right and image above) explained that a photograph is a 'dead image,' and could bring bad luck to the divers. Of the five men a year ago who could call themselves "the *valentia* divers," two of them lost their lives in 2010. Their loss has compounded the superstitions that cloak the night-time plunges into the Camotes Sea.

I journeyed to the Philippine island of Nocnican (nok-NOH-kan) to meet the remarkable men who risk their lives each full moon – for the sake of a seashell. Too many collectors think of the 'value' of a shell in monetary terms and forget the human cost of collecting certain species. Geographically, Nocnican is a speck of an island, sitting north of Bohol yet culturally quite separate from it. Like the other inhabitable islands in this area, it is overcrowded, so that the houses literally spill out over the sea. There is no room for crops, so the people owe their livelihoods to the sea. No tourists come here and there are no provisions for visitors. So few outsiders visit this area that I was constantly trailed by a crowd of children who kept touching my skin and shouting "*White! White!*" Of the many men who support families by hookah diving for fish, a handful from Nocnican have chosen to search for *L. valentia* in a deep-water channel north of their island.

Nocnican (often written 'Nucnucan') seems a happy island, bustling with people anxious to make friends. The *valentia* divers are different though – very serious men, bonded by an acute awareness of the perils of their chosen profession. I was fortunate enough to interview all three surviving divers. The youngest of



them is 'taking a break' from *valentia* diving, having collected 270 specimens in 10 years. No doubt the loss of his two friends last year has influenced his decision. Several other *valentia* divers have also perished in the last decade.

The rainy season, August through December, is best for collecting *L. valentia*, despite the typhoons. A full moon tempts the *L. valentia* out of their crevices. At the August 2011 full moon I was able to accompany the *valentia* boat (the *Windy Marie*) onto the Camotes Sea, travelling in a separate boat. The crew of six includes two *valentia* divers, a 'safety diver,' and an operator for the air compressor. There is a proper 'send-off' from Nocnican, with the obvious anxiety of the divers' families contrasting with the excitement of many of the island children. Once out on the open sea, the crew's routine includes catching their own fish before dark and preparing a hearty meal – fish and rice, cooked over coals on the boat itself.

After dark, the divers prepare their rather basic equipment. Their 'fins' are made from pieces of wood, cut into

shape and then strapped to their feet using plastic bags. They have no access to dive computers, dive tables, or even depth gauges. Since the boat is not anchored, they have no reference line of any kind to assist with their descent and ascent. On a night dive, the sense of disorientation must be extreme. The divers' stress is magnified by the coldness of the water at those depths. As experienced SCUBA divers know, stress contributes to the risk of decompression sickness.

To try to get some small insight into how the divers feel, I stayed in the water myself above their dive site, using a mask, snorkel, and fins. My overwhelming feeling was that "There's an awful lot of *black* down there..." Despite very clear water, the divers' lights were invisible from the surface. I couldn't possibly imagine how it felt for the divers 250ft below me, relying on primitive diving equipment and an inherently unreliable air supply. Sometimes they see sharks coming out of this blackness.

The *L. valentia* live on an undersea wall, often in small caves. They tend to be found on algae-covered rocks. On a very good night a pair of divers might find four *L. valentia*; the best ever 'haul' was seven specimens. Many times though, the divers must return to Nocnican empty-handed. Very occasionally these divers will find a *Lyncina leucodon* (Broderip, 1828), which lives at the same depth as *Leporicypraea valentia*.

After 30 minutes of diving, I heard the compressor operator signal that the divers were starting to ascend. A slow ascent is essential to prevent pressurized gases forming bubbles in the bloodstream, causing decompression sickness – 'the bends.' After 30 minutes of ascending, the divers' lights were just visible to me, hovering on the surface. Then their lights went together and shone directly upwards. This is the signal for "*We have valentia!*" The mood of the crew remained somber, however – an ascent from that depth is always dangerous. A third diver entered the water using hookah, and swam down to check on the deep divers. The whole ascent took an hour. This particular night was a triumph for the divers and their crew: two beautiful live *L. valentia*.

Since I had lent the divers my own depth gauge, we knew the exact depth for these shells: 230ft (70m). Their maximum depth that night, though, was 250ft (76m). At these depths the slightest mishap or malfunction will likely be fatal. The same could be said for SCUBA diving at that depth, even when using several different tanks with exotic gas mixes (such as nitrogen-oxygen-helium 'trimix'). The nearest recompression chamber is a day's journey away. What went wrong last year, when two *valentia* divers died? I heard many rumors and fast-changing stories; they simply "passed out," I was told. Operating without depth gauges, did they exceed their depth limit? Was it a fault in the air compressor, or carbon monoxide poisoning? There were sinister rumors that alcohol played a role – either because the divers were drinking "to warm themselves up" before the dive,



In 15ft of water, a hookah diver searches for *Atrina vexillum* (von Born, 1778) close to Nocnican Island. The hookah hose is strapped to his mask and then wrapped round his waist, to lessen the chance of the diver losing it. One of his home-made wooden fins has been lost. The diver behind carries a make-shift spear gun, to catch fish.

"Tasting the hookah"

Surface-supplied diving ('hookah') is used in the Philippines because of the expense of SCUBA. The diver has a simple hose that provides a steady air supply from a compressor on a boat above. No regulator or mouthpiece is used, and no auxiliary air source is carried. Apart from economy, hookah has the advantage that the supply of air is inexhaustible. The inherent danger, of course, is that any fault in the surface equipment means an immediate out-of-air emergency. Since two (or more) divers share one compressor, there is no help from the 'buddy.' Philippine compressors are powered by gasoline, which produces carbon monoxide as it burns; many hookah divers have succumbed to carbon monoxide in their air supply.

or because the compressor operator became drowsy. Perhaps the divers simply came up too fast.

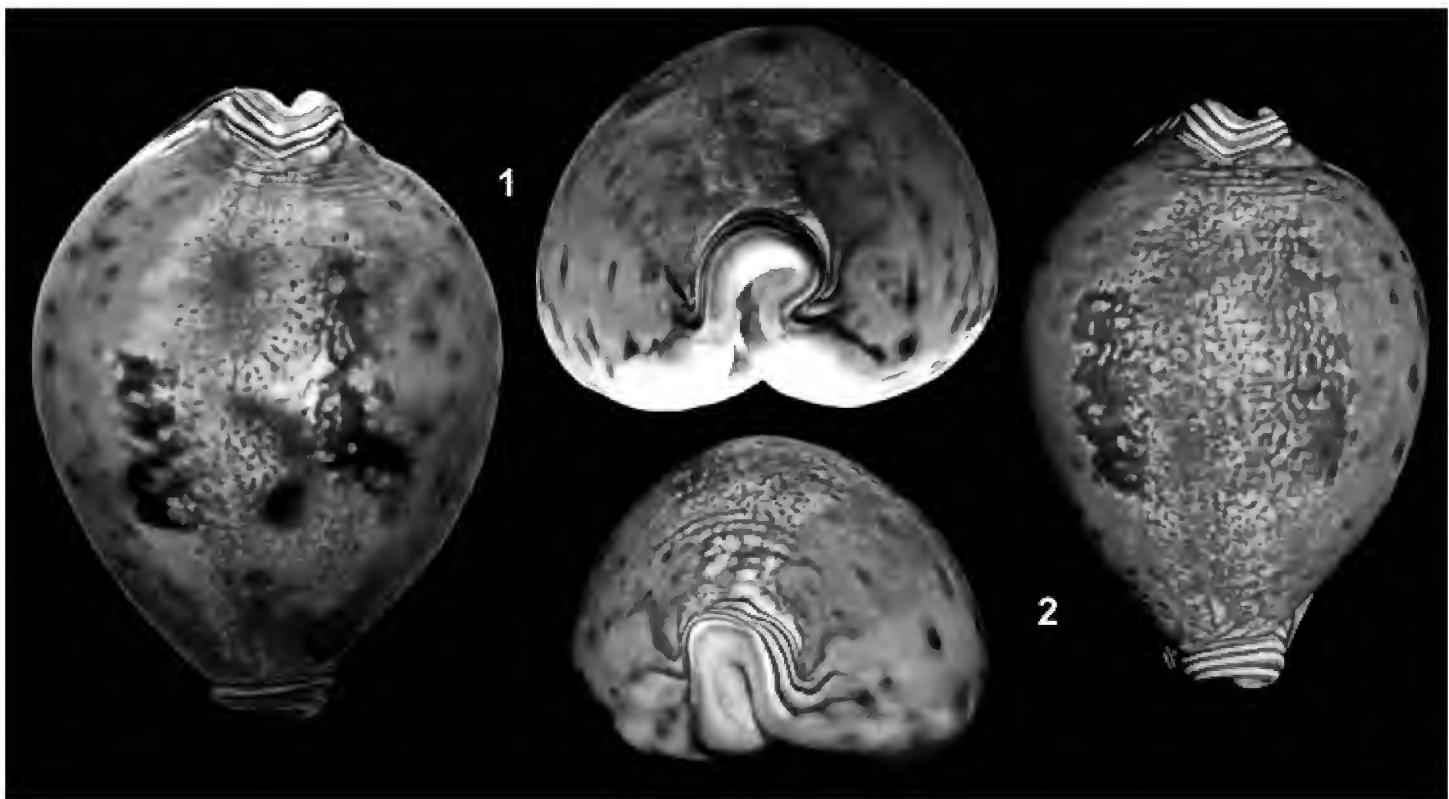
Understandably, this was a difficult topic for the Nocnican community to discuss. What is certain is that for a while after the tragedy there were no *L. valentia* collected. Now, once again, this cowrie is one of the hardest to obtain from the Philippines, after a brief period in the early 2000s when there seemed a reliable supply. It is undeniably one of the most beautiful of all the cowries, but visiting Nocnican Island and working with the *valentia* divers makes me regard the shell quite differently. We should never think of these wonderful objects as mere 'commodities,' to be bought, sold, and traded. Each *L. valentia* comes at a human cost.



Valentia divers Wilson (left) and Enrique (right) proudly display the results of their 250ft night-time dive.



A pair of living *L. valentia*, just brought up from 230ft. The ‘asking price’ for these two shells was equivalent to several months’ typical income in Bohol; this reflects the risks involved in hookah at such depths. These divers also collected one *L. mappa* (L., 1758), a large *Spondylus gloriosus visayensis* Poppe & Tagaro, 2010, and a *Conus circumcisus* von Born, 1778.



(1) A very fine 90.7mm *Leporicypraea valentia* (dorsum and anterior views) from north of Nocnocoan Island, compared with (2) an 83.1mm specimen (dorsum and posterior views) collected off Sogod, Cebu, using a net. Few specimens can be graded F+++ or gem, and many imperfect ones are ‘doctored’ (repaired) in Cebu. Fake *valentia* are laboriously created from specimens of the only other member of the genus, *L. mappa*, by building up the dorsum with resin to imitate the very distinctive shape. The

Acknowledgements

I extend my gratitude and respect to Wilbert ‘Wilson’ Dungog, Enrique Paquibot, and Noel Belleza of Nocnocoan Island. I thank Johan Cabilao for interpreting between Cebuano and English, and my friends on Calituban Island for providing all-night transportation. The photographs in this article appear courtesy of Simon’s Specimen Shells Ltd.

AMS-COA: celebrating 200 years of shelling in America

American Malacological Society Annual Meeting

June 16-21, 2012

Conchologists of America Convention

June 19-24, 2012

Paul Callomon



You are invited to join us for a historic event – the first back-to-back annual meetings of the country's two premier shell societies, including joint sessions, major speakers, and fabulous social events!

The venue is the **Crowne Plaza Philadelphia Hotel** in Cherry Hill, New Jersey, a superb modern facility in Cooper River Park that offers unparalleled access and amenities. Just over the nearby Ben Franklin Bridge lies Philadelphia, where the formal study of mollusks in the United States began 200 years ago with the founding of the Academy of Natural Sciences in 1812.

Over a packed eight days we will celebrate the bicentennial of Conchology and Malacology in the Americas, starting with the annual meeting of the AMS, taking in the first-ever joint session with the COA on Wednesday June 20th, and finishing up with the COA Bourse on Saturday and Sunday, 23rd and 24th. A banquet for both societies will be held at the hotel on the evening of the 20th, with a keynote address by the renowned cone venom specialist **Dr. Baldomero "Toto" Olivera**. Throughout the week there will be presentations and workshops featuring major names from here and abroad, from expedition leader extraordinaire **Dr. Philippe Bouchet** to renowned author **S. Peter Dance**.

COA guests will enjoy oral and silent auctions and the usual interesting, informative programs. Of particular interest to society members will be the special session hosted by the Smithsonian's **Dr. Ellen Strong** and featuring presentations by past winners of COA student grants. Many of these have gone on to become professional malacologists, including such household names as **Dr. Rüdiger Bieler** and **Dr. Jose Leal**.

There will be a reception for both societies on Tuesday evening at the Academy of Natural Sciences in Philadelphia, offering a great opportunity to meet and talk shells with some of the world's leading scientists and collectors within the hallowed walls of the oldest operating natural history museum in the Americas. The Academy's panoply of conchological immortals will be present in ghost form, including Thomas Say, Isaac Lea, Timothy Conrad, George Tryon and Henry Pilsbry.

Guests who sign up for one of the conventions will be offered a significant discount for the other, and day rates will be

available for both.

For more details of the venue and events, see the application form included with this issue.

Leisure

Philadelphia is a premier tourist destination, with national treasures such as the Liberty Bell and Constitution Hall alongside some of America's finest museums. The Center City area is a short cab or bus ride away. In the other direction, regular trains for Atlantic City leave from close by the hotel, with free shuttles from Atlantic City Station to the major casinos.

On the morning of Saturday June 23, several excursions are planned for attendees, including:

The Adventure Aquarium

Formerly the New Jersey State Aquarium, this state-of-the-art venue features approximately eight thousand animals living in varied semi-aquatic, freshwater, and marine habitats. The facility has a total tank volume of over 2 million US gallons (7,600 m³), and public floor space that covers nearly 200,000 square feet. Highlights include touchable sharks and the famous hippos! www.adventureaquarium.com

Philadelphia Museum of Art

Academy of Natural Sciences staff will conduct a special tour of one of America's largest and most famous art museums, focusing on shell-related themes and artifacts. A unique opportunity to see one of the world's great art collections in a conchological light!

Wagner Free Institute, Philadelphia

A museum of a museum, the Wagner's current exhibits and building date back to 1885. The main hall, one of America's architectural treasures, houses a Victorian natural history museum in its original state. Step back in time and see how things were done before electricity!

Deadline for registration at the regular rate is May 1st, 2012



The meeting venue: Crowne Plaza Philadelphia at Cherry Hill



Wagner Free Institute of Science Lecture Hall (Photograph by Tom Crane, courtesy of the Wagner Free Institute of Science)



Wagner Free Institute of Science Exhibit Hall (Photo by David Graham, courtesy of the Wagner Free Institute of Science)



The Philadelphia Museum of Art



Hippos at the Adventure Aquarium

Report of the 5th Annual Ohio River Valley Unified Malacologist Meeting (OVUM), 2011, Thomas More College Center for Ohio River Research and Education, California, Kentucky, October 01

Contributed by Meghann Vincie King and Dr. Timothy Pearce

In attendance: Charles Acosta, Francisco Borrero, Mariah Clements, Zsuzsanna Cooke, Joe Darpel, John Ferner, Clara Folb, John Hageman, Nick King, Meghann Vincie King, Ronald Lange, Olivia Lantry, Steve Lilly, Christopher Lorentz, Christopher Owen, Megan Paustian, Timothy Pearce, Warren Pryor, Lori Schroeder, Jeff Schroeder, Amsula Stone, Alexandria Wright.

The Ohio River Valley Unified Malacologists met for their fifth year at the Thomas More College Center for Ohio River Research and Education (TMC CORRE), also known as the TMC Biological Field Station, located on the Ohio River in California, Kentucky, across the river from Cincinnati. There were 22 total in attendance and nine mollusk presentations given. The meeting began with a welcome and background talk of the field station by Dr. Chris Lorentz, a Thomas More College biology professor and director of the TMC CORRE. Dr. Timothy Pearce then described OVUM and its origins. Several talks regarding snails or slugs included the following: Dr. Pearce talked about whether wetlands are good habitat for land snails, Dr. Francisco Borrero spoke about the ecology of two common species of snails in tropical forest understory habitat in southern Costa Rica, Dr. Megan Paustian discussed invasive terrestrial slugs and their worldwide spread, specifically how it related to her Encyclopedia of Life project, and Jeff and Lori Schroeder presented a video of snail research completed in the Bernheim Research Forest in Clermont, Kentucky. Dr. Charles Acosta brought marine experience to the meeting with his talk on

modeling population dynamics of the queen conch *Strombus gigas* Linnaeus, 1758, under heavy fishing pressure in Belize. The remaining talks related to freshwater mussels, including the following: Dr. Warren Pryor presented his studies on temperatures in a mussel habitat located in Crooked Lake, Indiana, Mariah Clements discussed her masters research on the projected effect of photoperiod on the metabolic rate in *Pyganodon grandis*, Meghann Vincie King presented her masters research on development of a suitable diet for rearing captive endangered juvenile oyster mussels *Epioblasma capsaeformis* (Lea, 1834), and Nick King displayed and described his photo documentation of a natural fish host infestation by *Epioblasma capsaeformis*. After the meeting, five participants took a tour of the mollusk collections at the Cincinnati Museum Center led by Dr. Borrero.

Dr. Warren Pryor expressed his interest in hosting OVUM 2012, hence the meeting will be held next fall at the University of St. Francis in Fort Wayne, Indiana.



Megan Paustian presents a talk on invasive terrestrial slugs and their spread worldwide.



Some meeting attendees, left to right: Dr. Francisco Borrero, Dr. Megan Paustian, Ronald Lange, and Dr. Charles Acosta.

TREASURES REVEALED
SHIELDS OF THE AMERICAS
The 29th Philadelphia Shell Show
At the Academy of Natural Sciences of Drexel University, Philadelphia
October 20 and 21, 2012

2012 SHELL SHOWS & RELATED EVENTS (Jan. – Jul.)

- Following information is subject to change. Please verify with individual organization -

Jan. 14-15 2012	SPACE COAST SEASHELL FESTIVAL Melbourne, FL The Melbourne Auditorium, 625 E. Hibiscus Blvd. Alan Gentleman, 2225 Tanglewood Lane, Merritt Is., FL 32953-4287 E-mail: lychee@cfl.rr.com (321) 454-3239	May 26-27 2012	SUNCOAST CONCHOLOGISTS SELLERS JAMBOREE , Largo, FL MINNREG Building, 6340 126 th Ave. North Carolyn Petrikin, 2550 Sweetgum Way West, Clearwater, FL 33761 Email: jamoboree2012@aol.com (727) 796-4117
Jan. 21-22 2012	47th ANNUAL BROWARD SHELL SHOW Pompano Beach, FL Pompano Beach Rec Center, NE, 18 th Av. & NE 6 th St. Nancy Galdo, 4266 Chase Ave., Miami Beach, FL 33140-3008 E-mail: nancygaldo@gmail.com (305) 531-0036		CELEBRATING 200 YEARS OF MOLLUSCAN STUDIES IN AMERICA Dual events hosted by The Academy of Natural Sciences & The Philadelphia Shell Club:
Feb. 17-19 2012	SARASOTA SHELL SHOW , Palmetto, FL Manatee Convention Center, 1 Haben Blvd. Donna Cassin, 3432 Highlands Bridge Rd., Sarasota, FL 34235 E-mail: dcassin941@gmail.com (941) 362-3302	Jun. 16-21 2012	AMERICAN MALACOLOGICAL SOCIETY ANNUAL MEETING Website: http://www.malacological.org/meetings/next.html
Feb. 25-26 2012	ST. PETERSBURG SEA SHELL SHOW , Seminole, FL Seminole Rec Center, 9100 113 th St. N., Seminole, FL Bob & Betty Lipe, 348 Corey Avenue, St. Pete Beach, FL 33706 E-mail: blipe@tampabay.rr.com (727) 391-2197 <i>Exhibit form at web site: http://www.stpeteshellclub.org</i>	Jun. 19-24 2012	CONCHOLOGISTS OF AMERICA ANNUAL CONVENTION Web site: www.conchologistsofamerica.org Crowne Plaza Hotel, 2349 W. Marlton Pike, Cherry Hill, NJ 08002 Contacts: Gary Rosenberg E-mail: rosenberg@ansp.org (215) 299-1033 Amanda Lawless E-mail: lawless@ansp.org (215) 299-1174
Mar. 1-3 2012	SANIBEL SHELL SHOW , Sanibel, FL - Grand 75th Anniversary Shellabration - Sanibel Community Center, Periwinkle Way Anne Joffe, 1163 Kittiwake Circle, Sanibel, FL 33957 E-mail: sanibelchiton@aol.com (239) 472-3151	Jun. 23-24 2012	TOWNSVILLE SHELL SHOW Townsville, Queensland, Australia Orchid Society Hall, Charles Street, Kirwan Glenda Rowse, 19 Farrell Street, Kirwan 4814, Qld, Aust. 61 (7) 4773-2817
Mar. 3 - 4 2012	PARIS INTERNATIONAL SHELL SHOW , Paris, France New Location: Espace Charenton, 327 rue de Charenton, 75012 Paris Perrine Dardart, 8, Rue des Tilleuls, 02190 Pignicourt, France E-mail: perrine.dardart@gmail.com 33 (3) 23-22-46-41	Jul. 7 - 8 2012	KEPPEL BAY SHELL SHOW Yeppoon, Queensland, Australia Gus Moore Pavilion at the Yeppoon Show Ground Jean M. Offord, 277 McDougall St., N. Rockhampton, Qld. 4701, Australia 61 (7) 4928-3509
Mar. 8-10 2012	MARCO ISLAND SHELL CLUB SHOW XXXII Marco Is., FL United Church of Marco Island, 320 North Barfied Jae Kellog, 1402 N. Collier Blvd., Slip D-6, Marco Island, FL 34145 E-mail: pjsailkw@gmail.com (239) 253-8483		NORTHERN FLORIDA SUMMER CELEBRATION co-sponsored by two shell clubs: Back-to-back shell shows with in-between shelling excursions
Apr. 14-15 2012	9th NATIONAL SEA SHELL SHOW , Adelaide, S. Aust. Goodwood Community Center, 32 Rosa Street, Goodwood Wayne Rumball, 53 Huihui Dr., Happy Valley, SA 5159 E-mail: nadwayr@ottusnet.com.au 61 (8) 8381-3987	Jul. 13-15 2012	GULF COAST SHELL SHOW , Panama City Beach, FL City of Panama City Beach Senior Center, 423 Lyndell Lane Jim Brunner, 2511 Parkwood Drive Panama City, FL 32405 (850) 215-2086 Email: jili@knology.net
Apr. 28 2012	BRITISH SHELL COLLECTOR'S CLUB CONVENTION , Essex, England Theydon Bois Community Centre, Essex John Whicher, Higher Marsh Farm, Henstridge, Somerset BA8 0TQ, UK Email: john@whicher.plus.com 4 (196) 336-3715	Jul. 20-22 2012	JACKSONVILLE SHELL SHOW , Jacksonville, FL Morocco Shrine Auditorium, 3800 S. St. Johns Bluff Road Charlotte Thorpe, 1010 N. 24 th St. Jacksonville Beach, FL 32250 (904) 246-0874 E-mail: challoyd@bellsouth.net
May 19-20 2012	XXII BELGIUM INTERNATIONAL SHELL SHOW Antwerp, Belgium “Extra Time” Sports Hall, Louisalei 24, Hoboken Charles Krijnen, Burgemeester Jansenstraat 10, NL-037 NC Tilburg, Nederland E-mail: bvc.shellshow@planet.nl 31 (13) 463-0607 Web site: www.bvc-gloriamaris.be/beurs_e.htm		Information Source: DONALD DAN , COA Awards Chairman 6704 Overlook Drive Ft. Myers, FL 33919 U.S.A. Tel. Voice & Fax (239) 481-6704 E-mail: donaldan@aol.com SH-DATE1.2011 Revision 2011-11-30
May 21 - June 2 2012	OREGON SHELL SHOW , Portland, OR Oregon Museum of Science & Industry, 1945 SE Water Ave. John Mellott, 1310 Crowley Avenue SE, Salem, OR 97302 E-mail: retheresa@comcast.net (503) 363-5017		

Ocenebra, Pteropurpura, and Ocinebrellus (Gastropoda: Muricidae: Ocenebrinae) in the northwestern Pacific

Roland Houart

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Institut Royal des Sciences Naturelles de Belgique

Introduction

Since the release of "Review of the Recent species of *Ocenebra* Gray, 1847 and *Ocinebrellus* Jousseaume, 1880 in the Northwestern Pacific" by Houart & Sirenko (2003), many specimens of *Ocenebra*, *Pteropurpura*, and *Ocinebrellus* from the China Sea and neighboring localities have been offered on shell auctions. I will here describe and illustrate these species, trying to illustrate as many forms as possible. The following species are included: *Ocenebra acanthophora* (A. Adams, 1863), *O. inornata* (Récluz, 1851), *O. lumaria* (Yokoyama, 1926), *Pteropurpura* (*Pteropurpura*) *esycha* (Dall, 1925), *P. (P.) modesta* (Fulton, 1936), *P. (P.) plorator* (Adams & Reeve, 1845), and *P. (Ocinebrellus) falcata* (Sowerby, 1834).

The high intraspecific variation in shell morphology in Ocenebrinae has led to an impressive number of synonyms and also to a number of misidentifications, not only in this part of the world but also in other regions like Europe and the northeastern Pacific. On the other hand, some of these names now considered synonyms may turn out to be valid species thanks to DNA research. It should be kept in mind, however, that species separated out as a result of DNA research usually form groups with similar shell characters and with well-defined and/or restricted geographical distribution.

The species studied here originate from the North Pacific, more precisely from the Sea of Okhotsk (1), the Sea of Japan (2), the Yellow Sea (3), and the East China Sea (4) (Fig. 1). The subfamily Ocenebrinae does not occur in the Tropical Indo-West Pacific.

The most useful shell characters for precise identification are found in the morphology of the protoconch, the early teleoconch whorls, the varical wings, the spiral sculpture, and the length and form of the siphonal canal. To a lesser extent, the number of varices or varical wings of the last teleoconch whorl can be used, but this number is highly variable in a few species and thus of little real use. The size of the aperture is another useful tool in some instances.

Abbreviations

NHMUK: The Natural History Museum, London, U.K.

MNHN: Muséum national d'Histoire naturelle, Paris, France.

SMF: Forschungsinstitut Senckenberg, Frankfurt, Germany.

USNM: National Museum of Natural History, Washington, D.C., U.S.A.

UMUT: The University Museum, The University of Tokyo, Japan.

RH: collection of Roland Houart.

Figures 2-19 (scans of black and white photographs)

2-3. *Ocenebra acanthophora* (A. Adams, 1863). Syntype NHMUK 2002062, Tsusaki, Japan, 38.5 mm.

4-12. *Ocenebra inornata* (Récluz, 1851).

4-5. Syntypes MNHN, Korean Sea, 31 mm; 6. Syntype of *Murex talienwhanensis* Crosse, 1862, MNHN, 36.5 mm; 7. Lectotype of *Trophon incomptus* Gould, 1860, USNM 1689, Hakodate, Hokkaido, Japan, 15 mm, photo courtesy A.J. Baldinger and R. Johnson; 8-9. Syntypes of *Murex crassus* A. Adams, 1853, NHMUK 20020263, China. 8: 31 mm, 9: 22.2 mm; 11-12. Syntypes of *Murex endermonis* E.A. Smith, 1875, NHMUK 73.8.6.29, Japan. 11: 30 mm, 12: 31.5 mm.

13. *Pteropurpura* (*Pteropurpura*) *modesta* (Fulton, 1936). Syntype NHMUK, Kii, Japan, 31.5 mm.

14-15. *Pteropurpura* (*Pteropurpura*) *plorator* (A. Adams & Reeve, 1845)

14. Syntype NHMUK 79.2.26.100, Korean Archipelago, 38 mm; 15. Syntype of *Murex expansus* Sowerby, 1860, BMNH 1971005, China, 41.5 mm.

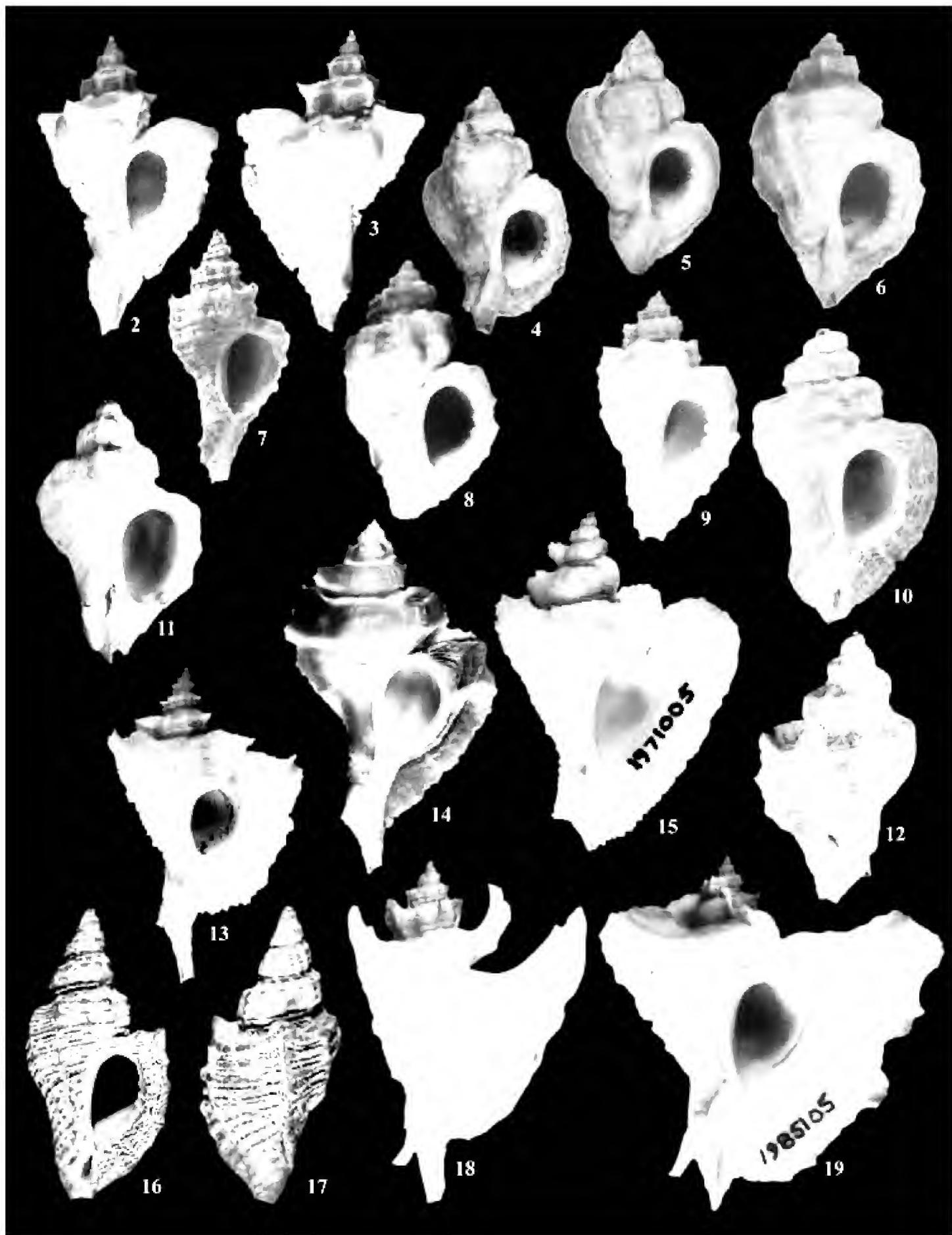
16-17. *Ocenebra lumaria* (Yokoyama, 1926). Holotype, Sawane Formation, UMUT CM no. 23118, 19 mm, photo courtesy Dr. Sasaki.

18-19. *Pteropurpura* (*Ocinebrellus*) *falcata* (Sowerby, 1834)

18. Syntype NHMUK 1974126, Japan, 39 mm; 19. Syntype of *Murex eurypteron* Reeve, 1845, BMNH 1985105, Japan, 44.9 mm.



Fig. 1 Study area map.



Genus *Ocenebra* Gray, 1847

Type species by monotypy: *Murex erinaceus* Linnaeus, 1758

***Ocenebra acanthophora* (A. Adams, 1863)**

Figs. 2-3, 37-41, 75, Table 1

Phyllonotus acanthophorus A. Adams, 1863: 372; Sowerby, 1879, fig. 151.

Murex endermonensis Sowerby, 1879 (Murex), as *acanthophorus* var.

Distribution. Western and Northeastern Taiwan, East China Sea and Yellow Sea, depth unknown, and Tsusaki, Japan (type locality), in 50-200 m.

Description. Shell up to 60 mm in height at maturity, with 1.5-1.75 protoconch whorls and up to 6 teleoconch whorls. Protoconch large, high, smooth, shouldered (Fig. 75). Axial sculpture of last teleoconch whorl with 3-5 broad high varices with moderately long or long, broadly open spine at shoulder. Spiral sculpture of numerous, low rounded primary, secondary, and tertiary cords. Last whorl with 7 spiral cords on subsutural ramp and 32 to 40 cords or more (primary, secondary and tertiary cords) on convex part of whorl occasionally of same strength. The fifth primary cord (P5) occasionally ending as short labral tooth. Aperture large, ovate. Outer lip crenulate, weakly erect, with very weak denticles within. Columellar lip narrow, smooth, adherent. Siphonal canal moderately long, broad, straight, sealed. White, light brown, or dark brown, occasionally with darker spiral bands.

Remarks. *Ocenebra acanthophora* differs from *O. inornata* by having a shell with a comparatively more triangular outline, a more strongly shouldered last whorl, and a longer, obviously narrower, siphonal canal. It differs from *O. lumaria* by the same characters and by having more numerous, narrower, and lower spiral cords. Some specimens of *O. acanthophora* may have only 3 varical wings on the last teleoconch whorl and could be confused with *Pteropurpura* species. It differs from *P. plorator* and *P. esycha* in having a different protoconch morphology, comparatively narrower spire whorls, and usually in having heavier, narrower, and more numerous spiral cords. It differs from *P. falcata* and *P. modesta* in having a narrower, more triangular shell with less expanded varical wings and by having more obvious, narrower spiral cords. The name *endermonensis* has been applied to small and undeveloped specimens.

***Ocenebra inornata* (Récluz, 1851)**

Figs. 4-12, 20-36, 72-73, Table 1

Murex inornatus Récluz, 1851: 207, pl. 6, fig. 8.

Murex crassus A. Adams, 1853.

Murex japonicus Dunker, 1860.

Trophon incompta Gould, 1860.

Murex talienwhanensis Crosse, 1862.

? *Murex (Cerastoma) endermonis* E.A. Smith, 1875.

Distribution. South Taiwan to South Sakhalin Island, intertidal to 12 m. Accidentally introduced with oysters in the USA: coasts of

Oregon, Washington, and British Columbia, particularly in Puget Sound, and more recently in the Bay of Oléron, France, since 1995 and in the Netherlands since 2007.

Description. Shell up to 60 mm in height, with 1.5-2 protoconch whorls. Protoconch large, smooth, weakly shouldered (Figs. 72-73). Axial sculpture of last teleoconch whorl with 4-6 narrow or broad, rounded or bladelike varices. Spiral sculpture of usually moderately high primary cords and low secondary and tertiary cords. P5 occasionally ending as short labral tooth. Aperture large, broad, roundly-ovate. Columellar lip narrow, smooth. Outer lip weakly crenulate, with low, weak denticles within. Siphonal canal short or moderately long, straight, sealed. Shell white, beige, light tan, tan, brown, or dark brown. Uniformly colored or with one or more darker spiral bands or blotches or with lighter colored varices.

Remarks. *Ocenebra inornata* has a highly variable shell morphology, as is usual in many ocenebrine species. Some specimens of *O. inornata* have strong rounded varices, other shells have varices with thin lamellae, while some intermediate forms have rounded varices on early whorls and bladelike varices on the last whorl. A careful examination of the shell structure, however, does allow us to consider all these various forms to be conspecific. Only one form remains doubtful and could be worth a name on its own: *O. endermonis* (E.A. Smith, 1875). It is therefore doubtfully included in the synonymy. The syntypes of *O. endermonis* and a few other studied shells have a moderately strong labral tooth formed by the extension of the fifth primary spiral cord. Such a labral tooth is rarely observed in the other forms of *O. inornata*, and if so, it is very short and does not alter the form of the spiral cord (Sirenko & Houart, 2003). A beautiful form from Japan and the South China Sea with 4-7 lamellate varices, occasionally with adapically bent shoulder spines, wrongly identified as "Pteropurpura adunca," was illustrated by Radwin & D'Attilio (1976: pl. 22, fig. 10) and Tsuchiya (2000: pl. 193, fig. 124) and is recently seen in auctions on websites (Figs. 32-33, 36) [see also under *Pteropurpura (Ocinebrellus) falcata*].

***Ocenebra lumaria* Yokoyama, 1926**

Figs. 16-17, 42-46, 74, Table 1

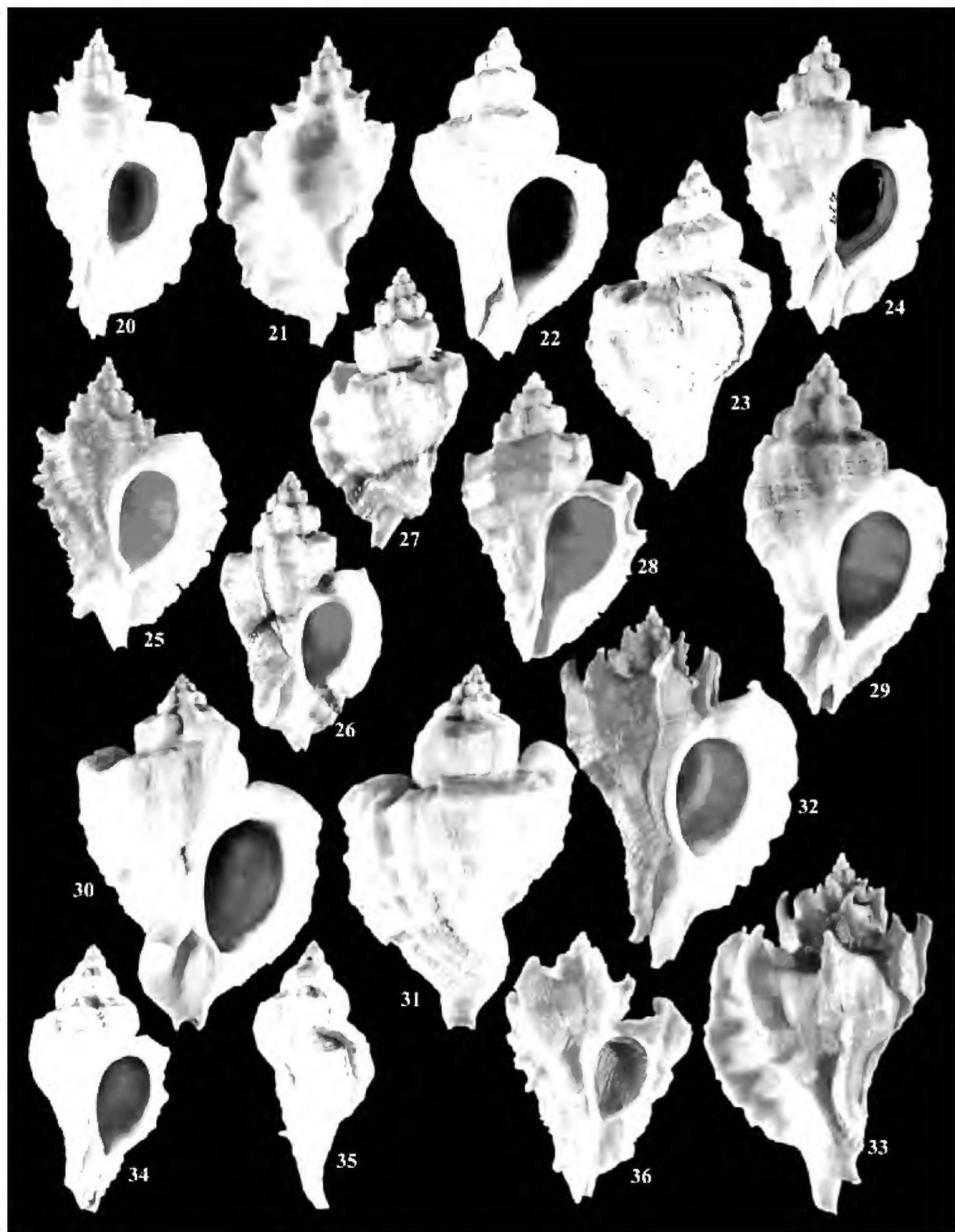
Ocenebra lumaria Yokoyama, 1926: 270, pl. 32, fig. 21.

Distribution. South Korea, northern Japan Sea, Honshu and northeastern Hokkaido, and south Sakhalin Island, intertidal to 8 m, on rocks.

Figures 20-36 - *Ocenebra inornata* (Récluz, 1851)

20-21. Posjet Bay, near Korea, RH, 44.1 mm; **22-23.** Hokkaido, Japan, RH, 51.8 mm; **24.** Hokkaido, Japan, RH, 41.4 mm; **25.** Paengnyongdo Island, S Korea, RH, 41.6 mm; **26-27.** Pomsom Island, S Korea, RH, 40.2 mm; **28.** Puget Sound, Washington, USA, RH, 41 mm.

29. Oleron Island, France, RH, 50.7 mm; **30-31.** Oleron Island, France, RH, 45.6 mm; **32-33.** Huanghai Sea, RH, 52 mm; **34-35.** Hokkaido, Japan, RH, 26 mm; **36.** Tokyo Bay, Japan, RH, 35.4 mm.



Description. Shell up to 35 mm in height at maturity, with 1.5 protoconch whorls. Protoconch small, smooth, rounded (Fig. 74). Axial sculpture of last teleoconch whorl with 4-6 broad, moderately high, adaperturally squamose, bladelike varices. Spiral sculpture of high primary, secondary, and tertiary cords. Aperture large, ovate. Outer lip weakly crenulate, low or weakly erect, with low, occasionally indistinguishable denticles within. Siphonal canal short, straight, weakly abaperturally bent at tip. Grayish-white or light tan, occasionally with darker, light-brown spiral band.

Remarks. *Ocenebra lumaria* was described from the Pliocene of Sado Island, Niigata Prefecture, Japan, but live specimens are collected as well. This species differs from the most similar *O. inornata* in having a small, rounded protoconch (Fig. 74), while *O. inornata* has a broad, occasionally shouldered, protoconch (Figs. 72-73). *O. lumaria* also has high, more apparent primary, secondary, and tertiary spiral cords and spiral sculpture on the subsutural ramp.

Genus *Pteropurpura* Jousseaume, 1880

Type species by original designation: *Murex macropterus* Deshayes, 1839

Pteropurpura (Pteropurpura) esy whole (Dall, 1925) Figs. 47-48, 76, Table 1

Murex esychus Dall, 1925: 21, pl.32, fig.9; pl.33, fig.6.

Distribution. Southeastern Japan, Kyushu to Kii Peninsula, in 150-200 m.

Description. Shell up to 37 mm in height (holotype), with small, rounded, weakly flattened protoconch of 1.3-1.5 whorls (Fig. 76) and weakly shouldered, broadly convex, finely rugose teleoconch whorls. Axial sculpture of last teleoconch whorl of 3 wing-like varices. Spiral sculpture of weak to moderately high primary and low secondary cords. Aperture large, broadly-ovate, with smooth columellar lip. Outer lip smooth within. Siphonal canal short, broad, strongly dorsally bent, sealed. White or light tan with irregular light brown markings.

Remarks. This is a very handsome and apparently very rare species. The holotype was illustrated by Kaicher (1978: 1624), while other specimens were figured by Radwin & D'Attilio (1976: 130, pl. 22, fig. 5) and by Tsuchiya (2000: 388, pl. 193, fig. 119). Most of the shells seen on websites and in recent auctions and identified as *P. esy whole*, are actually specimens of *P. plorator* (form *expansa*). *Pteropurpura esy whole* differs from *P. plorator* in having a lower and more broadly convex spire, broader, more rounded teleoconch whorls, and a short, strongly backwards-bent siphonal canal (longer and almost straight in *P. plorator*). The protoconch of *P. esy whole* is also comparatively broader, low, and weakly flattened.

Pteropurpura (Pteropurpura) modesta (Fulton, 1936) Figs. 13, 66-71, 77, Table 1

Ocenebra (Ocenebrellus) modesta Fulton, 1936: 10, pl.2, fig.3.

Distribution. Japan, Kyushu to Wakasa Bay and Boso Peninsula, in 30-200 m (Tsuchiya, 2000).

Description. Shell up to 35 mm in height, with a small, strongly adapically shouldered protoconch of 1.5 whorls and 6 strongly shouldered teleoconch whorls. Protoconch with a narrow keel adapically (Fig 77). Axial sculpture consists of 3 webbed varices extending to midway of the siphonal canal. Other axial sculpture of a single, small, low, broad knob at shoulder. Spiral sculpture of fairly strong, low primary, secondary, and tertiary cords. Aperture ovate, columellar lip smooth, outer lip smooth within. Siphonal canal moderately long, narrow, sealed, weakly abaxially bent. White, cream, tan, or light brown, occasionally with brown blotches below the suture and on some primary spiral cords.

Remarks. This species was illustrated as *Pteropura stimpsoni* (A. Adams) by Kira (1969: 24, fig. 11) and Tsuchiya (2000: pl. 193, fig. 120). *Murex stimpsoni* A. Adams, 1863, was succinctly described and not illustrated and can also be the three-varical form of what previously was described as *M. falcatus* Sowerby, 1834. *M. stimpsoni* was subsequently illustrated by Sowerby (1879: fig. 196), but he illustrated a narrow shell with short and broad siphonal canal and with a broadly winged apertural varix (Fig. 84). No type was located in NHMUK, so that its real identity is still currently doubtful, and Fulton's name is preferred to designate this small, beautiful, and apparently rare Japanese muricid. For comparison with *P. falcata*, see notes under that species.

Pteropurpura (Pteropurpura) plorator (Adams & Reeve, 1845) Figs. 14-15, 49-53, 54-57, 78-79, Table 1

Murex plorator A. Adams & Reeve, 1845: pl.1, fig. 191.

Murex expansus Sowerby, 1860.

Pteronotus brachypterion A. Adams, 1863.

Distribution. Taiwan, South and East China Sea, Yellow Sea to Kyushu (Japan), in 50-200 m.

Figures 37-53

37-41. *Ocenebra acanthophora* (A. Adams, 1863)

37-38. South Taiwan Strait, RH, 44 mm; **39-40.** East China Sea, RH, 46.8 mm; **41.** Yellow Sea, RH, 51.3 mm.

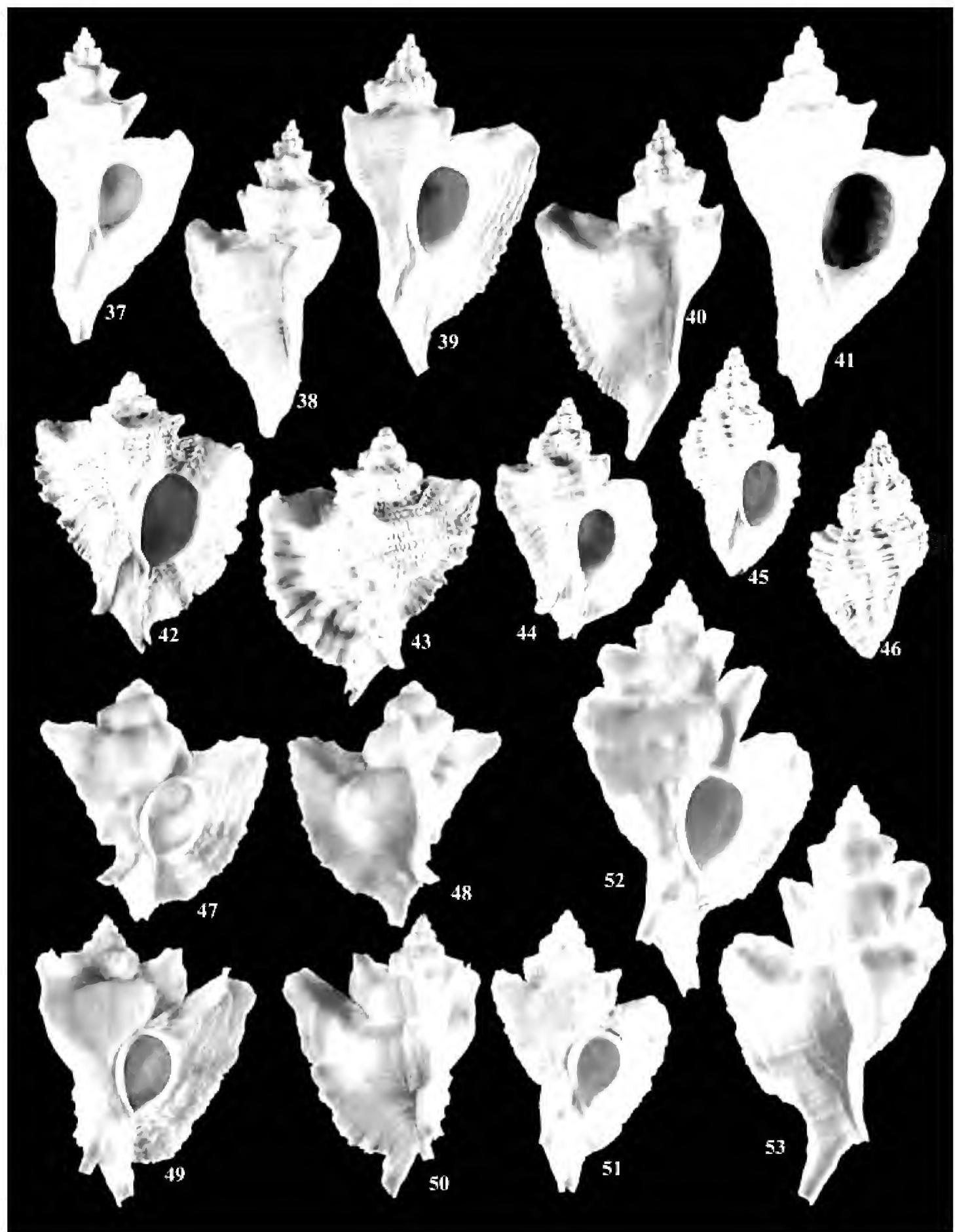
42-46. *Ocenebra lumaria* (Yokoyama, 1926)

42-43. South Honshu, Japan, RH, 35.3 mm; **44.** Vostok Bay, Japan Sea, RH, 27 mm; **45-46.** Nemuro, Japan, RH, 21.8 mm.

47-48. *Pteropurpura (P.) esy whole* (Dall, 1925). Ashizuki-Zuki, Japan, RH, 27.8 mm.

49-53. *Pteropurpura (P.) plorator* (A. Adams, & Reeve, 1845)

49-50. East China Sea, RH, 38.3 mm; **51.** NW Taiwan, RH, 39.1 mm; **52-53.** East China Sea, RH, 58.3 mm.



Description. Shell up to 80 mm in height, with small, rounded, low protoconch of 1.5 whorls (Figs. 78-79) and broadly convex teleoconch whorls. Axial sculpture of last teleoconch whorl of 3 wing-like varices. Intervarical area smooth, usually with a low, single, broad node. Spiral sculpture of weak, low primary, secondary, and tertiary cords, but occasionally almost smooth. Aperture broadly-ovate, columellar lip narrow, smooth. Outer lip smooth within. Siphonal canal moderately long or long, straight or weak abaxially, and backwards-bent. Ochre, light tan, or brown, usually with darker colored spiral band, occasionally with dark brown broad spots below suture and on periphery of whorls. Aperture white within.

Remarks. *Pteropurpura plorator* is an apparently common species, which always has 3 wing-like varices on the last whorl, as in all the other *Pteropurpura* s.s. species. The shell morphology is not very variable, although the wings may be more or less expanded and the siphonal canal moderately long or long. The spiral sculpture is almost always missing, although it can be present in some specimens (Fig. 51). There are only two synonyms: *P. brachypteron* which was described but not illustrated and for which no type was located in NHMUK, but the description is assimilated to that of *P. plorator*. *Murex expansus* is smaller than the typical form, however always with one teleoconch whorl less. The siphonal canal is also relatively shorter, but this feature is also observed in some typical forms of *P. plorator* (Figs. 52-53), so I consider *M. expansus* as a junior synonym of *P. plorator*.

Pteropurpura (Pteropurpura) stimpsoni (A. Adams, 1863)

Fig. 84

Pteronotus stimpsoni A. Adams, 1863: 371; Sowerby, 1879, fig. 196

Remarks. See under *P. modesta*.

Subgenus: *Ocinebrellus* Jousseaume, 1880

Type species by original designation: *Murex eurypteron* Reeve, 1845 (= *Murex falcatus* Sowerby, 1834)

Ocinebrellus was named by Jousseaume (1880: 335). Two years later (1882: 333), he included what he thought was a different species: *Ocinebrellus falcatus* (Sowerby). He also included *O. aduncus* (Sowerby), and *O. acanthophorus* (A. Adams), both here considered as *Ocinebrellus* species. He described *Ocinebrellus* as follows (translation): "Shell with low spire with very depressed whorls near the suture; whorls with 4 winged varices, extending to the middle of the siphonal canal; aperture ovate with erect and continuous edges; siphonal canal closed, quite long and tapered anteriorly". The shell of *Ocinebrellus* is thin and light with 4 (rarely 3 or 5) thin, large, and broad bladelike lamellae, a narrow, long, sealed siphonal canal (longer than the height of the aperture), and a strongly erect outer apertural margin (From Houart & Sirenko, 2003).

Pteropurpura (Ocinebrellus) falcata (Sowerby, 1834)

Figs. 18-19, 58-65, 80-81, 82-83, Table 1

Murex falcatus Sowerby, 1834: pt.62, fig. 31; Sowerby 1841: 145
Murex aduncus Sowerby, 1834.
Murex eurypteron Reeve, 1845.

Distribution. Taiwan, South and East China Sea, Yellow Sea to South Hokkaido, Japan, in 20-220 m.

Description. Shell up to 70 mm in height, with large, strongly shouldered, irregularly shaped protoconch of 1.5 whorls (Figs. 80-81) and 6 or 7 strongly shouldered, broad teleoconch whorls. Axial sculpture of last teleoconch whorl consisting of 3-5 broadly winged varices. Overall axial sculpture of irregular weak growth striae. Spiral sculpture of low primary, secondary, and tertiary cords, almost or completely obsolete on the last teleoconch whorl in most of the examined specimens. Spiral cords always present on first to third teleoconch whorls, occasionally present on fourth to sixth whorls. Aperture large, broadly-ovate. Columellar lip smooth. Outer lip smooth within. Siphonal canal moderately long, broad, sealed, tapered abapically, abaxially bent. White, cream, or tan, occasionally with brown blotches or light brown band at periphery.

Remarks. In a short note, Fulton (1917: 238) gave precedence to *Murex aduncus* Sowerby over *Murex falcatus* Sowerby. To explain his decision, Fulton wrote that *M. aduncus* was named in 1834 while *M. falcatus* was described in 1840, giving the first name a priority of about six years over *M. falcatus*. He overlooks the fact that *M. falcatus* was perfectly illustrated by Sowerby (1834: pl. 62, fig. 31). *M. falcatus* was described in 1841 (and not in 1840), but the illustration in 1834 is available and was given precedence over *M. aduncus* by Houart & Sirenko (2003: 71). The shell is quite variable in size and shape and number of varices, but it is easily identified thanks to its broad, irregularly-shaped and shouldered protoconch, its strongly shouldered whorls, its broad wing-like varices, its almost smooth last teleoconch whorl, and its quite long, broad, and tapered siphonal canal. The three-varical form (Figs. 19, 59-60) can be occasionally confused with *P. plorator*, however this species has broadly convex whorls (not shouldered) and a rounded protoconch. It can also be confused with *P. modesta* (see Figs. 58 and 66), but *P. modesta* is always smaller with the same number of teleoconch whorls and a narrower siphonal canal, as well as a smaller, regularly-shaped protoconch with a narrow keel adapically. A shell recently seen on websites and auctions is often identified as *P. adunca* (Figs. 32-33, 36). The type material of *Murex aduncus*

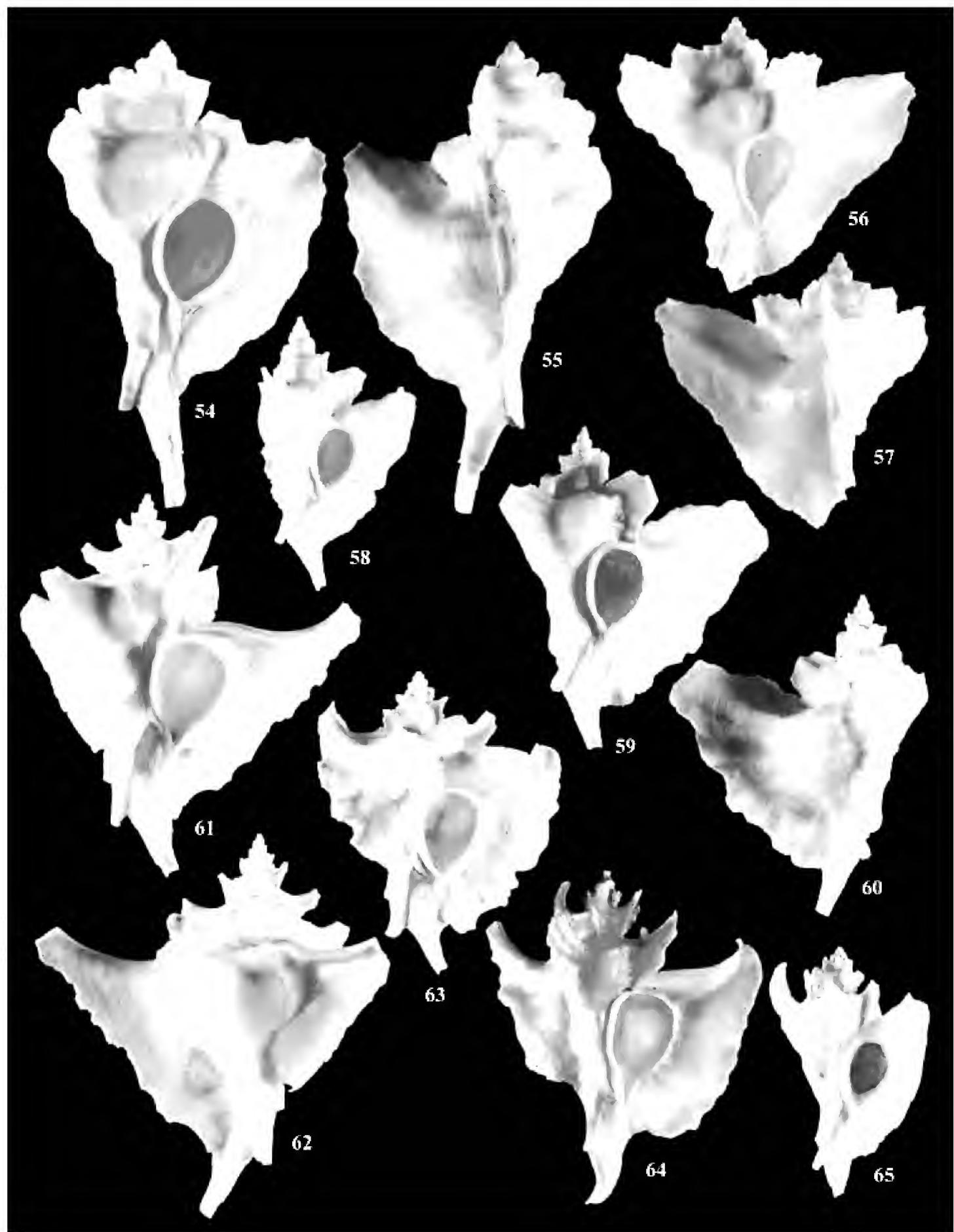
Figures 54-65

54-57. *Pteropurpura (P.) plorator* (A. Adams & Reeve, 1845)

54-55. East China Sea, RH, 80.4 mm; 56-57. Taiwan, RH, 35.1 mm.

58-65. *Pteropurpura (Ocinebrellus) falcata* (Sowerby, 1834)

58. East China Sea, RH, 43.5 mm; 59-60. South of Cape Nomo-Zaki, Japan, RH, 49.5 mm; 61-62. Minabe, Japan, RH, 64.6 mm; 63. Taiwan, RH, 57.3 mm; 64. Uruga Strait, Japan, RH, 52 mm; 65. Japan, RH, 35.9 mm.



was not located, however the original illustration (Fig. 82) leaves no doubt about its synonymy with *P. falcata* (compare Fig. 82 and 83) [see also under *Ocenebra inornata*].

DISCUSSION

No type material was located in NHMUK for *Murex caliginosus* Reeve, 1845 (Fig. 85), a species described without any locality data. The species was synonymised with *Ocenebra lugubris* (Broderip, 1833) by Vokes (1971: 27) and with *Pteropurpura falcata* by Houart (2010). The species was only illustrated dorsally (Reeve, 1845: pl.30, fig. 141). New material allowed me to compare this figure more carefully to some specimens of *O. erinaceus* (Linnaeus, 1758) from the Mediterranean (Fig. 86). I think there is little doubt that *M. caliginosus* is a junior synonym of the latter. No original material was ever illustrated for *Phyllonotus coronatus* A. Adams, 1863, or for *Phyllonotus unifasciatus* A. Adams, 1863, and the type material was not located in BMNH. Both names are probably junior synonyms of *Ocenebra inornata*, however a doubt remains because both were originally described as having an open siphonal canal.

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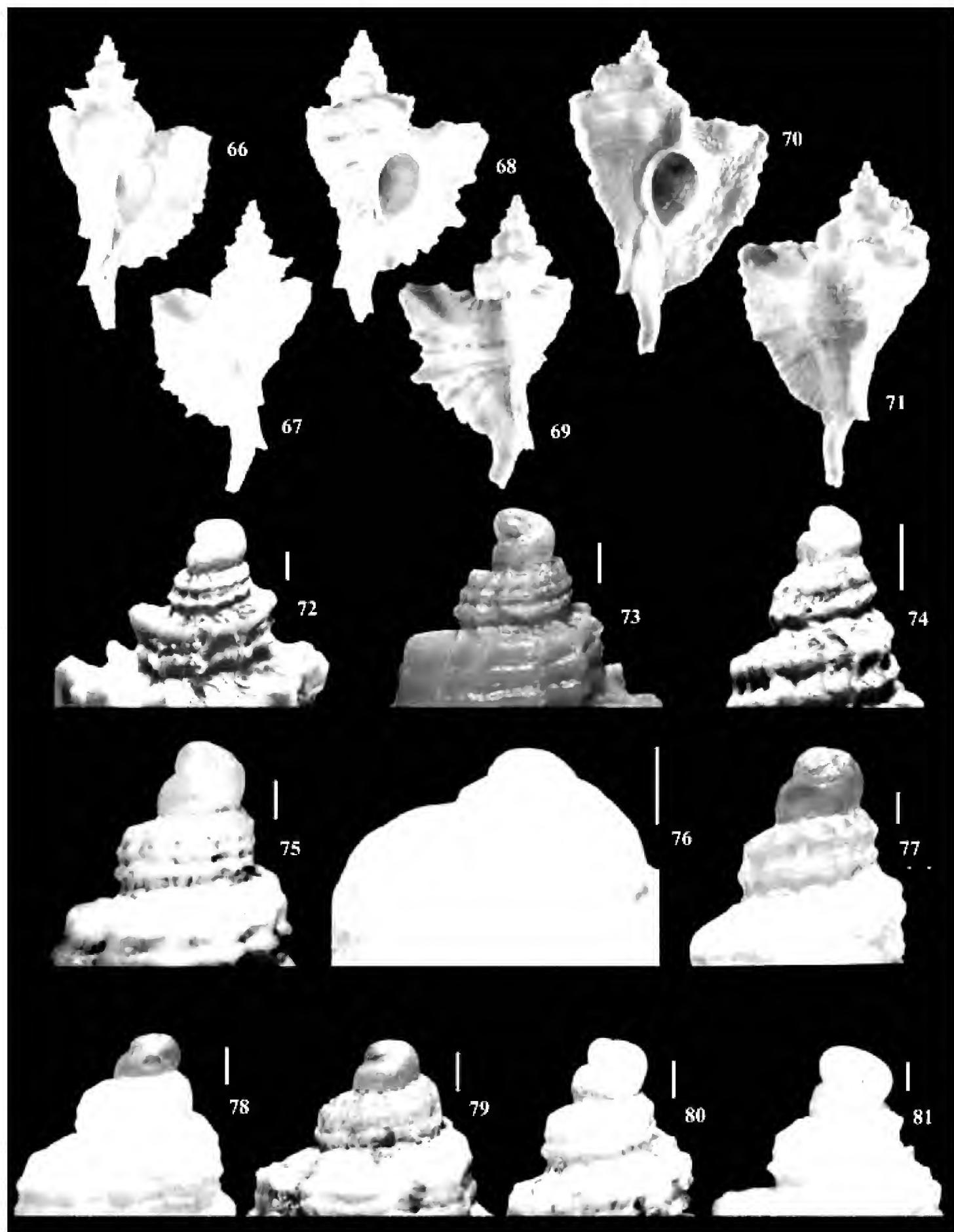
Figures 66-81

66-71. *Pteropurpura (P.) modesta* (Fulton, 1936)

66-67. Minabe, Japan, RH, 27.5 mm; **68-69.** Kumamoto, Japan, RH, 26.7 mm; **70-71.** Kusui, Nada-Cho, Wakayama Pref., Japan, RH, 34.9 mm.

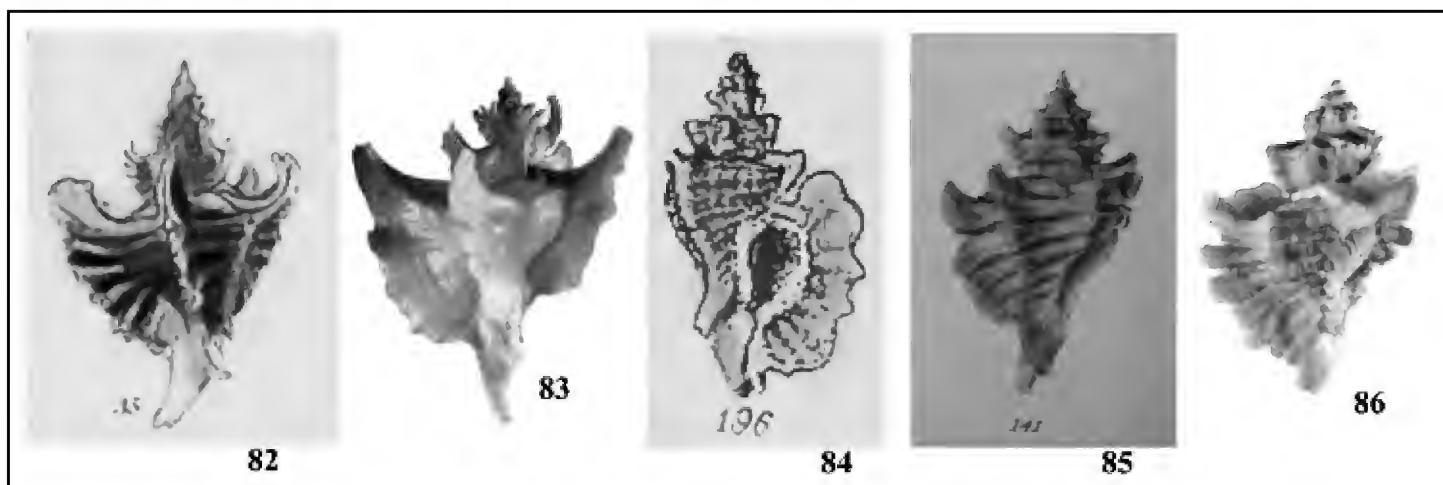
72-81. Protoconchs (scale bar 500 µm) (all RH)

72-73. *Ocenebra inornata* (Récluz, 1851). **72:** Chino, Korea; **73:** Yellow Sea; **74.** *Ocenebra lumaria* (Yokoyama, 1926), Hokkaido, Japan; **75.** *Ocenebra acanthophora* (A. Adams, 1863), South Taiwan; **76.** *Pteropurpura (P.) esycha* (Dall, 1925), Ashizuki-Zuki, Japan; **77.** *Pteropurpura (P.) modesta* (Fulton, 1936), Kumamoto, Japan; **78-79.** *Pteropurpura (P.) plorator* (A. Adams, & Reeve, 1845), East China Sea; **80-81.** *Pteropurpura (Ocenebrellus) falcata* (Sowerby, 1834). **80:** East Taiwan; **81:** Waita, Japan.



Character ↓	Name →	<i>O. acanthophora</i>	<i>O. inornata</i>	<i>O. lumaria</i>	<i>P. esysha</i>	<i>P. modesta</i>	<i>P. plorator</i>	<i>P. falcata</i>
Maximum size		60 mm	60 mm	35 mm	37 mm	35 mm	80 mm	70 mm
General outline		Triangular	Rounded	Triangular	Broadly triangular	Triangular	Broadly triangular	Broadly triangular
Protoconch		Large, 1.5-1.75 shouldered, high whorls	Large, 1.5- 2 weakly shouldered whorls	Small, 1.5 rounded whorls	Small, 1.3- 1.5 weakly flattened, low, rounded whorls	Small, 1.5 strongly adapically shouldered, with narrow keel adapically	Small, 1.5 rounded, low protoconch whorls	Large, 1.5 strongly shouldered, irregularly shaped protoconch whorls
Number of varicose wings on last teleoconch whorl	3-5	4-6	4-6	3	3	3	3	3-5
Spiral sculpture		Numerous, low, rounded cords	Moderately high primary cords, low secondary & tertiary cords	High, rounded cords	Weak to moderately high primary & low secondary cords	Fairly strong, low cords	Weak, low primary, secondary, & tertiary cords; occasionally smooth	Weak, low primary, secondary, & tertiary cords; occasionally smooth
Siphonal canal		Long, broad	Short to moderately long	Short	Short	Long, narrow or moderately broad	Long, broad	Long, broad

Table 1. Quick reference chart for Ocinebrinae in the northwestern Pacific.



Figures 82-86.

82. *Murex aduncus* Sowerby, 1834 (from Sowerby, 1834); 83. *Pteropurpura (P.) falcata* (Sowerby, 1834), Uruga Strait, Japan, RH, 52 mm; 84. *Murex stimpsoni* (A. Adams, 1863) (From Sowerby, 1879); 85. *Murex caliginosus* Reeve, 1845 (from Reeve, 1845); 86. *Ocenebra erinaceus* (Linnaeus, 1758), Malaga, Spain, RH, 32 mm.

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Brunner, L., 2000. The Neptunea Award. *American Conchologist* 28(3): 3. Sept.

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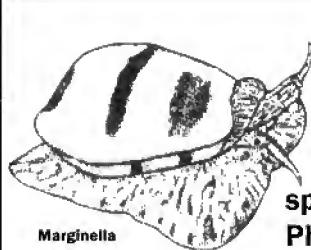


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Just released: *Tales of Neptune's Treasures*. An autobiography by Ed. T. Hanley, as told to Rhys G. Llewellyn. Softbound 368 pages, 80 photographs. \$19.95 plus \$3.55 s/h. Florida residents add \$1.20 state sales tax.

Adventurer, scuba diver, sheller, author, entrepreneur and operator of Sanibel's most unique store, Ed Hanley shares his true stories and experiences from over a half-century of collecting beautiful and rare shells and artifacts. The Appendix includes a complete set of Ed's illustrated columns, "Let's Shell Sanibel".

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Philadelphia COA Award

The annual Philadelphia Shell Show was held on 1-2 Oct 2011. This show is the largest of its kind in the Northeast and as in previous years it was held at the Academy of Natural Sciences in Philadelphia. Longtime shell show participant and winner of numerous shell show awards, Gene Everson, was awarded the COA trophy for his display of "Pecten Shells Worldwide." Gene's display totaled 30 feet with 13 cases. That is a lot of scallops.

Events at this year's show included:

- **Behind-the-Scenes Tour:** Guided tours of the Academy's Malacology collection of over 10 million specimens.
- **Meet Real Malacologists:** Talks with scientists from the Academy's Malacology Department and shell experts from the Philadelphia Shell Club.
- **International Shell Market**
- **Competitive Shell Displays**
- **Fine Shell Crafts:** A showcase of sailor's valentines and other fine shell crafts competing for prizes.



Above & below: Some of Gene's colorful scallops in the winning display.



Above: Gene Everson, an experienced diver and expert shell collector, holds his COA Award for the 2011 Philadelphia Shell Show. Gene adds this award to the many he has won in the past, with exhibits of a myriad of different molluscan families in almost every category of shell show display.

Below: The 13 cases and 30 feet of Gene's spectacular display.



GLORIA MARIS



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Edited by the Belgian Society for Conchology,
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North Carolina COA Award

The 2011 North Carolina Shell Show was held at the Cape Fear Museum in Wilmington, NC, Sept. 23-24 2011. As in years past, this was a well-attended and popular event. The Cape Fear Museum provides an excellent venue, accommodating all of the various displays with plenty of room for spectators. This year's winners of the COA Award were Ed Shuller and Jeannette Tysor for their superb display: "The Family Cassidae."



Above: The Cape Fear Museum.

Below: COA Award winners Ed Schuller and Jeannette Tysor.

Show award categories and winners included:

- **Best Photography:** Jeannette Tysor, *Cymatium nico-baricum*
- **Best Sailor's Valentine:** Jane Santini
- **Best Novice Award:** Lyle Therriault, North Carolina Bivalves
- **Best Self Collected Exhibit:** Vicky Wall, Hawaii Five-O
- **Best North Carolina Exhibit:** Lyle Therriault, North Carolina Bivalves
- **Best Arts and Crafts:** Jane Santini, Double Sailor's Valentine
- **Best Junior Award:** Megan Ward, The Tusk Shell
- **Best Self Collected Shell:** Vicky Wall, *Triplofusus giganteus* (albino)
- **Best Shell of the Show:** Dr. Ron Hill, *Bayerotrochus midas*
- **Janet Durand Award:** Susan Roche, Sculpture using Shell Fragments
- **Dean and Dottie Weber Environmental Awareness Award:** Sheila Nugent, Shells from Sanibel and Captive Islands
- **Hugh Porter Award:** Sheila Nugent, In Search of the Acadian Subprovince
- **DuPont Trophy:** John Timmerman, Limitless Variety
- **COA Award:** Ed Schuller and Jeannette Tysor, The Family Cassidae





Philippine Marine Mollusks Vols 1-4

by Guiddo T. Poppe (with additional subject matter expert authors)

2008-2011, Conchbooks Publishing, Hackenheim, Germany
pp. 759 (vol. 1), 849 (vol. 2), 665 (vol. 3), & 676 (vol. 4), a total of 1,315 color plates

ISBN Vols. 14: 978-3-939767-19-0, approx. \$130 for each volume

If you want great color images of Philippine mollusks (many you have probably never seen), multiple images of each species (with many *in situ*), then these books are a must. Be prepared though. If you order all four volumes at the same time, your mailman may quit speaking to you. The four volumes total 29.7 lbs (13.5 kilos), but if you want to identify Philippine molluscan species, then you will have to put your mailman to the test.

This is not a rewrite of the old standard, "Shells of the Philippines," by Springsteen & Leobrera (1986), but rather a complete departure with superb photographs (typically multiples of each species) and over three times the number of species covered. The original "Shells of the Philippines," illustrates over 1,600 molluscan species; the new "Philippine Marine Mollusks" (vols. 1-4) illustrates over 4,600 species in some 1,000 color plates with

over 11,000 color images. If you want to identify a Philippine marine mollusk (or even a species from somewhere else in the Indo-Pacific), there is an extremely high probability you will find it in these volumes.

Obviously, no single individual could be knowledgeable enough to correctly identify all of the various marine molluscan species in the hundreds of families and multitudes of genera found in the Philippine waters. Correct identification is, however, what these volumes are intended to accomplish. So how did Guiddo Poppe accomplish this? He contacted subject matter experts from around the world, amateur and professional, and invited each to review, edit, and write about the family or families with which they were familiar. There will still be errors (after all, typographical errors tend to be a given with volumes of this size and changes in systematics and taxonomy continue as our knowledge of the world around us increases), but they are kept to a minimum and the reader will find these books surprisingly accurate and helpful.

Volumes 1 & 2 cover Gastropoda, volume 3 finishes the Gastropoda (including nudibranchs) and begins the Bivalvia, and volume 4 finishes the Bivalvia and covers the Scaphopoda and Cephalopoda, as well as molluscan species (287) newly-named or discovered since the books were initially published. This was an immense undertaking and deserves a place in the reference library of anyone interested in Philippine shells. Due to the size and weight of these books I would recommend using them at a table, rather than attempting to balance them on a knee while at the computer, but recommend them, I do.

Living Shells

by Charles Rawlings,
MD, JD

2010, Ivy House Publishing,
Raleigh, North Carolina
pp. 124, the majority with
11x14 inch color plates or
11x28 inch double page color
plates
ISBN13: 978-1-57197-509-6,
approx \$37

Dr. Charles E. Rawlings has for many years provided *American Conchologist* with colorful images of living mollusks *in situ*. These images are often one-of-a-kind and depict a species never before photographed in its natural habitat. As editor, I have dozens of his photographs on file, each one waiting for the time when I need a great looking color image to illustrate an article or spark up the magazine cover.

Now you too can own many of these same images. This large, coffee table style book is full of larger-than-life images of both common and rare, shelled and shell-less mollusks. There are eight species depicted for the first time in their natural habitat, in color and with magnified detail unavailable even if you had been the one behind the camera, at night, at 100 feet.

The book is separated into 10 chapters, plus introduction, index, etc. Chapter titles are: Cowries; Cones; Voluts; Moonsnails, Harps, Sundials, and Tuns; Conchs; Abalones; First Photographs; Bivalves; and Cephalopods. Individual photographs are identified in the "Photo Index." This section is broken down into the chapter headings and lists the scientific name of each species and the page number where it is presented. A 14-inch depiction of the cowrie *Blasicrura teres* (Gmelin, 1791) with its brilliant orange mantle is followed a few pages later by a close-up of a *Cypraea tigris*



Linnaeus, 1758, with its dark mantle spread over 2 pages (28 inches)! A favorite of mine is a two-page spread of *Voluta musica* Linnaeus, 1758. It is a side view of the animal foraging at night. A rather elegant view of a rather common volute going about its business. The cover, by the way, with its brilliant reds, oranges, and the rarely seen blues, is the mantle of *Tridacna squamosa* Lamarck, 1819.

This is not an identification book or a scientific treatise, but more of a celebration of the wonders of living mollusks: with colors, shapes, and textures that disappear when the shell is collected and cleaned. For all of the beauty that can accompany a dried sea shell, this book serves as a reminder that the dried shell represents much more than is visibly apparent. Thank you, Dr Rawlings.

American CONCHOLGIST

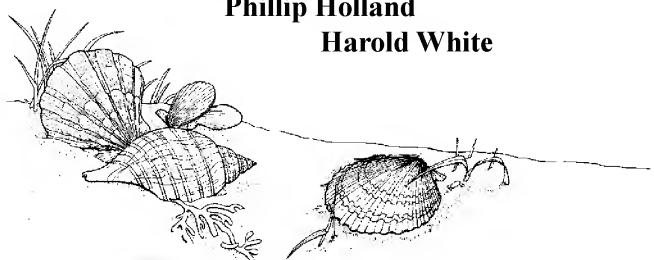
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In Memoriam:

Nadine Athearn
Phillip Holland
Harold White



How *The Cone Collector* began

António Monteiro and William J. Fenzan

The Cone Collector (TCC) is a free electronic magazine for shell collectors and anyone interested in cones. Articles try to interest cone collectors of all kinds – both beginners and advanced specialists. Sometimes the articles are scientific, while at other times they just illustrate beautiful specimens, depict art featuring cone shells, or cover other topics related to the subject of cones.

The magazine is sent to subscribers four times a year. To subscribe, just send an e-mail request to the editor, António Monteiro (a.j.a.monteiro@netcabo.pt). Issues are available online as portable document format (.pdf) files so they can be downloaded and read by a wide audience. Individual issues are available at www.theconecollector.com and on several other websites operated by friends. Presently, there are about 200 direct subscribers from around the world. There are also many individuals who do not subscribe, but download individual files from one of the hosting web sites.

The TCC project was born in October 2006 when a trial issue – appropriately labeled # 0 – was sent to a small number of potentially interested readers. Although I already had some experience in editing malacological publications, I was not entirely confident that a magazine only about cones would be popular. Fortunately, the reception surpassed every expectation. It was something that was simply begging to be done!

From 1982 to 1992, I acted as the editor of a serial entitled *Publicações Ocasionais*, published by the Portuguese Malacological Society. I also edited most issues of the society's newsletter, *Halia*, during the same period. After the demise of the society, I began editing a newsletter for Portuguese shell collectors, entitled *O Búzio*. The first issue was dated May 1998. It has been an ongoing publication ever since, appearing every other month, to the present day. More recently, however, widespread use of the internet allows for more ambitious projects.

In the early years of this century I was regularly in touch with a number of shell collectors interested in, or exclusively focused on, cone shells. After 45 years of collecting a wide variety of shells, I decided to concentrate on cones. I did keep my collection of scallops though, which I collect for purely aesthetic reasons.

As I exchanged electronic messages with several friends, such as Paul Kersten, Mike Filmer, and Manuel Jimenez Tenorio, I came to realize two things: first, there was a vast amount of news and information concerning cones that was coming in quite regularly; and second, such information was scattered throughout a wide range of publications, making it hard for collectors to keep up with it all. Cones are an exciting group. There is much to be learned about them. A great deal of research is being undertaken, especially with regard to conotoxins. There are also many systematic problems yet to be solved. New species are being described on almost a monthly basis.

So far, a total of 18 issues of TCC have been published. The 19th issue is almost ready for distribution as I write. The



La Rochelle (France)

September 2012

first four issues had a rather amateurish graphics look, but it was the best I could do with the means at hand. Then, from issue #4 on, there was a huge improvement. André Poremski kindly volunteered to do the layout with professional quality! The result was truly wonderful. Now, TCC can boast of having first rate graphic quality.

As the number of contributors has increased, so too has the number of pages. Issue # 16 has a staggering 98 pages! It is the bulletin's aim to have something for everybody, from beginners to advanced collectors. All submissions are welcomed. Each issue also includes listings of recent publications on cones and recently described species. A special section called "Who's Who in Cones" includes short biographical notes on cone specialists so that eventually we all get to know each other a little better. The goal is to help everybody enjoy cone shells and cone shell collecting.

As TCC grew in popularity, a new project took form: the organization of an international meeting to discuss cones, to learn something about them, and to bring interested, and interesting, people together for a pleasant weekend. This idea was first discussed with Manuel Jimenez Tenorio and Bill Fenzan. Several possibilities were considered for its implementation. Bill's personal contacts with Hans-Jörg Niederhöfer, from the Staatliches Museum für Naturkunde, in Stuttgart, Germany, who kindly put the museum and its several facilities at our disposal to hold the meeting, finally made it all possible. An organizing committee that also included Klaus Groh was quickly brought together and we started to work on the new project.

A survey was sent to the TCC mailing list to assess the potential interest in a number of possible activities under consideration. Based on the many replies we received, a program was organized, which included several talks by well-known names in the field of cone studies: Dr. Alan J. Kohn, Dr. Baldomero Olivera, Dr. Thomas F. Duda Jr., Dr. Nicolas Puillandre, Dipl.-Geol. Hans-Jörg Niederhöfer, Dr. Dietrich Mebs, Dr. Christian Melaun, Dr. Manuel Jiménez Tenorio, and Mr. Paul H. Kersten.

The organizing committee arrived in Stuttgart on a Friday with high hopes but also a bit nervous lest the whole thing not go as planned. Personally, I relaxed about late Saturday morning, when participants began to ask when the second meeting would



The 1st International Cone Meeting was a huge success, with about 50 attendees from 15 different countries.

take place! I knew then that everybody was happy and that things were going according to plan.

Everyone's wishes being our command, the very same organizing committee has already begun work on a 2nd meeting! This time we have benefited from the kindness of Dr. Georges Richard, from the La Rochelle (France) Natural History Museum, who invited TCC to hold the meeting there. The location is quite convenient, a mere three hours from Paris by high-speed train and with much to offer participants. The Museum itself, recently reopened after a thorough renovation, has an extensive cone collection. The city of La Rochelle has many tourist attractions, including a large aquarium.

All things considered, attendees will be able to spend a thoroughly pleasant weekend at the second meeting. The date for the event is still to be settled, however those that are interested in

participating can get regular updates during the planning process by subscribing to TCC. The programs at the second International Cone Meeting will be different from those of the first, so even the participants of the first meeting can look forward to a new experience. As an extra feature of this meeting, the Paris Natural History Museum (MNHN Paris) will also support the event as a sponsor. They are planning to provide a display of cone type specimens preserved at the MNHN Paris, all of which will be available for study by participants.

I personally hope to see as many of you there as possible. If you are interested in more information about this meeting, or La Rochelle, you can also contact Bill Fenzan (bill@fenzan.com), who has visited La Rochelle from the United States and has written about it in TCC #15. He can provide travel advice and insight into the benefits of attending. Let's do it!

Seashell Poems and Reflections to Sooth the Soul

by Bev Bethell Dolezal

2011, self-published, approx. 25 pages, 12 color plates, available for \$15 at www.bahamabevs.com

This little gem is a fun read and among the 12 poems is sure to be one that will strike a chord in anyone who has ever wandered a beach collecting shells. Each poem is accompanied by a color plate (the author is a professional photographer). These are often quite striking and always a nice match to the poem. I am not really a poetry aficionado, but there were several poems in this book that brought a smile and thoughts of "Oh, how true." Some were "true" of collecting, others were "true" of the characteristics of a certain shell and the feelings it elicits in collectors. Unfortunately, I cannot quote any here because I lent my copy to a friend who does like poetry, and shells, and apparently book collecting (actually, it became a gift when it seemed unlikely to return on its own). I guess that is recommendation enough.

Bev, grew up in the Bahamas but now lives in Florida.



She runs shelling trips to the Bahamas, thus she knows exactly what the Sanibel Stoop is and, in fact, has some poetry that reflects on this malady. She attends many of the shell shows in Florida. So stop by her table, say hi, and give the book a glance or two. This collection of poetry is modestly priced and certain to bring enjoyment to its readers. The pictures will draw you in, the poems will bring on a smile.



COA Academic Grants Program

Academic Grants Director's Report

May 23, 2011

The COA Grants Committee consisted of Ellen Strong, Steve Lonhart, and yours truly. The Committee received 36 complete applications in 2011. The applications came from five countries: USA (24), Argentina (6), Brazil (3), Canada (1), Australia (1), Ireland (1). The pool of applicants included 32 students at different degrees of academic standing plus four non-students.

Eleven grants were awarded (see attached spreadsheet). COA awarded a \$15,000.00 for a total of \$58,209.87 requested. Countries of origin of grantees are: United States (9), Brazil (1), and Argentina (1). All but one award were granted to students, seven are PhD candidates and three are MS candidates.

The Walter Sage Memorial Award was not given;

The Paul and Heather Johnson Award went to Rafe Sagarin, University of Arizona, Tucson, USA;

The Clench and Turner Memorial Award (Boston Malacological Society) went to Abigail Cahill of Stony Brook University, New York, USA;

The Jacksonville Shellclub Award went to Julie Zill of University of Florida, Gainsville, USA.

Respectfully submitted,

Daniel L. Geiger, Ph.D.
COA Academic Grants Director

NAME	\$=student	Institution	Project Title	Amount
**CAHILL, Abigail	\$Ph.D.	Stony Brook University, New York	The effects of larval developmental mode on local adaptation to temperature in <i>Crepidula</i>	575
***ZILL, Julie	\$Ph.D.	University of Florida, Gainsville	Host specificity and density of eulimid parasites (Gastropoda: Prosobranchia) of echino	1500
JENKINS, Kirsten	\$Ph.D.	University of Chicago	derm hosts in Moorea, French Polynesia; an integrative study	
PEREZ, Leandro M.	\$Ph.D.	Facultad de Ciencias Naturales y Museo, Universidad Nacional de La Plata, Argentina	Variability in the Structure of Marine Molluscan communities over Space and Time: Testing for Natural and Anthropogenic Using Living, Death, and Fossil Assemblages	1500
MCCULLER, Megan	\$MS	University of New Hampshire, Durham	Neogene connections between the Caribbean and South Atlantic suggested by association	
PAULTZ, Stephanie	\$Ph.D.	Texas Tech University, Lubbock	of brackish bivalves from the Paraná formation (Entre Ríos, Argentina)	1400
KIMBERLY, David	\$Ph.D.	Texas Tech University, Lubbock	Two nudibranchs and their interactions against an invasive prey item	1375
*SAGARIN, Rafe	Adj. Prof.	University of Arizona, Tucson	Individual, population, and community level consequences of contaminant effects on	
TIEMANN, Jeremy	\$MS	Illinois Natural History Survey	predator-induced defenses	1500
MIYAHIRA, Igor C.	\$Ph.D.	Universidade Federal do Estado do Rio de Janeiro, Brazil	Multiple stressors and adaptive potential in the freshwater snail, <i>Physa pomilia</i> : insight	1500
HANSON, Dieta	\$MS	Cal Poly Pomona, California	into population persistence	
			The Indelible Stain of Human Impacts on <i>Plicopurpura columellaris</i> and <i>Nerita scabrida</i> Populations in Mexico	1500
			Effects of lowhead dams on aquatic gastropods	1200
			Distribution, morphology and systematics of <i>Diplodon spix</i> , 1827 (Bivalvia, Unionoida, Hyriidae) in Rio de Janeiro state, Brazil	1500
			The invasion pathway of the Japanese bubble snail, <i>Haminoea japonica</i> (Opisthobrachia: Haminoeidae).	1450

* Paul & Heather Johnson Award ** Clench & Turner Memorial Award (Boston Malacological Society) *** Jacksonville Shell Club Award

Greetings and a happy New Year!

It is time to announce the 2012 round for the Conchologists of America Academic Grants competition. The instructions are the same as for previous years; details can be found under <http://www.conchologistsofamerica.org/grants/>

Re eligibility: there are no restrictions on eligibility. Specifically, all nationalities, all places of residences, and students as well as non-students can apply. The usual maximum award is US\$1500. Most grants are given to degree-seeking students, which also constitute that largest group of applicants. Applicants from previous years can re-apply, including those, who have received funding. The submission deadline remains the same even in this leap year: February 28, 2012. Students are responsible to ensure that letters of recommendations have been sent on their behalf. All applications must be sent electronically in a common readable format (Word, .pdf). Keep file sizes small (<3 MB).

Please feel free to distribute this announcement to other interested parties. If you have any questions, feel free to contact me.

Best wishes and Good Luck

Daniel Geiger (Chair COA Academic Grants)

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Mysteries of scallop eyes

Anita J. Krause

In my Conchologists of America grant, I proposed to investigate the relationship between amino acid variation in rhabdomeric opsin (r-opsin) and specific photic environments (i.e. depth) in which the scallop species resides. R-opsin is a protein found in the photoreceptor of the scallop eye and is required for vision. Molecular changes in r-opsin can have dramatic effects on function by altering the ability of the protein to absorb specific wavelengths of light. I predicted scallop species living in shallower depths will have amino acid changes that permit opsin to absorb wavelengths nearer the red range of the visible spectrum, while species living in deeper water will have amino acid sequences to absorb wavelengths in the blue range of the visible spectrum.

I collected 98 different sequences from 29 species sampled across the scallop phylogeny and collected depth information for 26 of the 29 species through a literature review. Among species, DNA sequences can vary at particular motifs, suggesting putative functional change, while other motifs are conserved, indicating the sequences maintain the capability to process visual stimuli. After completing a preliminary analysis, these data suggest there is molecular convergence of r-opsin in the scallops that display the gliding behavior.

While collecting r-opsin molecular data, I found unexpected, yet intriguing, results that indicate scallops possess a second copy of r-opsin. Currently, nine of the 29 species sampled contain two r-opsin copies, which I refer to as r-opsin1A and r-opsin1B. While r-opsin1A and r-opsin1B are only 55% identical in the ami-

no acid sequence, both contain the important motifs required for normal visual function. This is the first report of multiple copies of the r-opsin gene in the scallop eye.

There are many questions concerning the functional role of the second r-opsin copy in scallop vision that I would like to pursue. On-going work includes identifying the phylogenetic relationships of r-opsin1A and r-opsin1B gene sequences and determining the expression pattern for these genes. Finding the second r-opsin copy opens the door to additional projects to study the origin of this second copy and provide insight to how it might perform visual tasks.

The Conchologists of America grant has helped fund one project and seed another. I will continue to collect sequence data to answer the hypothesis of r-opsin variation being correlated with photic environment while also exploring the relationships of the two scallop r-opsin copies. These complimentary projects will broaden the information known about visual pigments and their evolution in scallops.

Anita J. Krause -- ajkrause@iastate.edu

CONCHOLOGISTS



Nudibranch research

Kristen Roberts

Among the species of gastropods, with their magnificently whorled shells, lie a group just as magnificent but naked, the nudibranchs. Nudibranchs are the shell-less relatives of marine snails; their name literally translates into “naked gill.” Commonly referred to as “sea slugs,” I prefer to describe them as “butterflies of the sea.” Species can be found in every color of the rainbow throughout tropical, temperate, and even Arctic oceans. Some nudibranchs camouflage themselves to match their food source, while others advertise their toxins with brightly colored stripes and polka dots. Some even give off a pleasant aroma of cedar when handled!

These amazing little mollusks attracted my attention soon after I moved to California, where they can be found in abundance along the coast. I now study the evolution of nudibranchs as a graduate student at San Francisco State University. My research takes place at the California Academy of Sciences, where I have been collecting, dissecting, and genetically analyzing nudibranchs for the past three years. The group I have studied is Tergipedidae, a family that has been driving taxonomists crazy for over a century.

Instead of choosing to study a large vibrant or aromatic group of nudibranchs, I chose tergipedids, a rather unpopular and overlooked group. Why are they so unpopular? First of all, they are tiny. It requires a hand lens just to find most of these little guys in the field. Dissecting them requires an even bigger lens (a microscope) and a steady hand. Secondly, they are found all over the world and specimens have been collected in nearly every ocean. Consequently, nudibranch experts have been confusing each other with synonymous descriptions.

All this confusion has not deterred me, but has instead sparked my interest in Tergipedidae. Not only have researchers had a difficult time identifying tergipedids, they have not reached a consensus on their classification. And no one has even attempted to study the evolutionary relationships among its species. I was determined to be the first one to resolve these taxonomic debates and to understand evolution within Tergipedidae.

While previous research focused on the taxonomy (identification and classification) of tergipedids, my research involved both taxonomy and phylogenetics. Phylogenetics is the study of evolutionary relationships between species using modern-day molecular genetics techniques. Genetic data is used in combination with morphological characters to estimate a phylogeny, or an approximation of evolutionary relationships. Basically, my research looked at both genetic sequences and the anatomy of tergipedid species to better understand how they relate to one another. This is the first study that used genetics to study Tergipedidae and it helped resolve classification issues as well as establish the first ever phylogeny for this family.

The first step to studying tergipedid species involved acquiring specimens. Since the specimens were to be used in genetic research, they needed to be recently collected and preserved in 95% ethanol to maintain their DNA quality. Working in the California Academy of Sciences, I was fortunate to have a massive



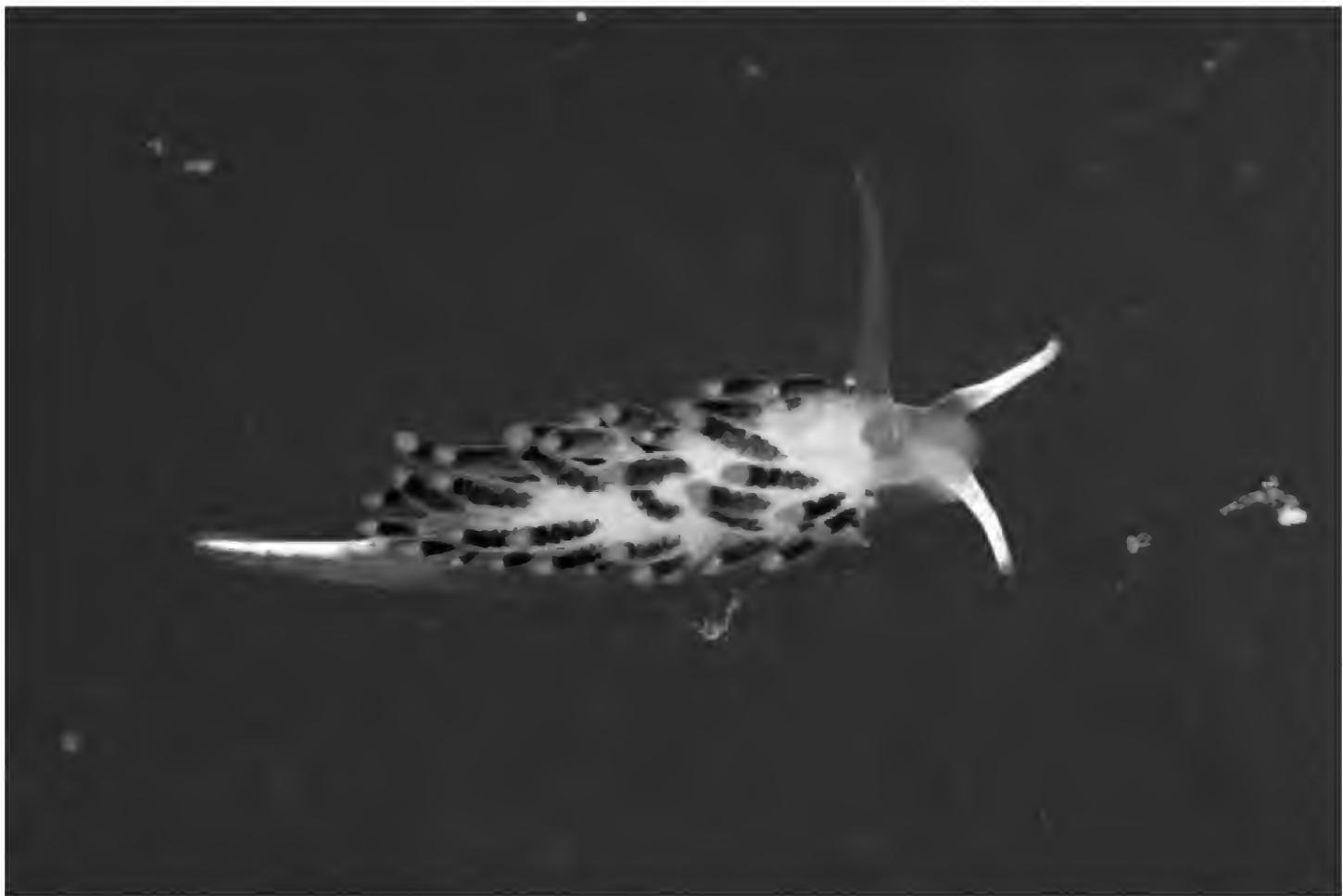
Team Nudibranch: (from left) Kristen Roberts, Larry Harris, and UNH graduate student, Megan McCullen.

collection of freshly collected nudibranchs at my fingertips. The Academy’s collection, however, lacked many species from the North Atlantic region, a diverse area for Tergipedidae in which many type species can be found. Since Tergipedidae species are found in nearly every ocean worldwide, it was essential that I adequately sample specimens from all over the world and this meant that I needed specimens from New England.

So, with the funding I received from the Conchologists of America grant, I was able to travel to New England for a week to collect all those species that the Academy’s collection was missing. I met up with Larry Harris at the University of New Hampshire and joined his lab of graduate students and post-docs on an expedition along the New England coast up to Eastport, Maine. Armed with



One of the dive sites in Maine.



A California tergipedid, *Cuthona lagunae* (O'Donoghue, 1926), approximately 10mm, photo by Terry Gosliner.

an entire nudibranch search crew, I sampled specimens from six different locations in New Hampshire and Maine, using both intertidal and SCUBA collection techniques. After one week I had collected over 42 specimens for my project including 11 species and 3 type species.

In the field I was introduced first-hand to the challenges of studying Tergipedidae. Did I already mention that Tergipedids are small? Well, in New England, they are not only small, but also very well camouflaged. While most species of snails can be identified long after the animal is dead simply by studying its shell, nudibranchs must be identified while the animal is still alive. Once the specimen is preserved, its color fades and the body often contorts into what looks like a chewed up wad of gum. After hours spent looking through hydroids and kelp with a hand lens, more hours were spent trying to identify the little beasts before they warmed up too fast in the sun.

After the tedious process of finding, identifying, and properly preserving all of my Tergipedid specimens, I began the next step of my research: the molecular analyses. Tissue samples were taken from the specimens and the DNA was extracted from each sample. I used this DNA to amplify and then sequence three genes for each sample. I aligned all of these sequences and ran various statistical analyses on them to create phylogenetic trees. With this data, I then looked for questionable specimens in these

trees and examined various anatomical characters to determine if they had been correctly identified.

Major results with my research have shown that by including genetic data our previous understanding of the family Tergipedidae was not entirely accurate. The data suggests that the family itself is not monophyletic, meaning it does not have one shared ancestor. Instead, groups within this family are more closely related to other families, such as Fionidae, Calmidae, and Eubranchidae, than to themselves. Also, in some cases, genetic data resolved questionable identities of specimens. And in a few cases, species that were confidently identified (and were used in picture identification guides!) were found to be in entirely different families altogether.

Tergipedids, as annoyingly small as they are, have proven to be an interesting group of nudibranchs to study. By incorporating genetic data into my research, this study has established a phylogeny and discovered aspects of their taxonomy that morphology alone could not have found. While it has not resolved every debate, it is a major leap forward in our understanding of Tergipedidae and ultimately, nudibranchs.

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